DOCUMENT RESUME

ED 054 883 RC 005 526

AUTHOR Valencia, Atilano A.

TITLE Bilingual/Bicultural Education -- An Effective Learning Scheme for First Grade and Second Grade Spanish Speaking, English Speaking, and American Indian Children in New Mexico.

INSTITUTION Southwestern Cooperative Educational Lab., Albuquerque, N. Mex.

PUB DATE Aug 71

NOTE 134p.

EDRS PRICE MF-$0.65 HC-$6.58

DESCRIPTORS Achievement Tests; *American Indians; Anglo Americans; Attitude Tests; Biculturalism; *Bilingual Education; English (Second Language); Grade 1; Grade 2; *Mexican Americans; *Primary Grades; *Program Evaluation; Spanish Speaking; Standardized Tests

IDENTIFIERS New Mexico

ABSTRACT

The 1970-71 evaluation of the Grants, New Mexico, Bilingual Education Project is reported through narrative description of tests administered and their results, statistical findings from analyses of variance or covariance of test results, and conclusions and recommendations based on test results. In the evaluation, the 147 students in the experimental and the 35 students in the control group--representing 6 schools and 4 language references (Keresan, English, Spanish, and Navajo)--were given various tests for which a pre-test/post-test measure was used to ascertain significant experimental group gains over an 8-month period: the Southwestern Cooperative Educational Laboratory Test of Oral English Production; the California Achievement Test; the Test of Basic Experiences (a Spanish-language instrument measuring concept comprehension in science, social studies, and mathematics); the Caldwell Test (a Spanish-language instrument for measuring a child's ability to provide responses about himself and his role activities); and the author's Cultural Sensitivity Instrument (a pictorial and manipulatory measure of perceptions and attitudes concerning Anglo Americans, American Indians, and Mexican Americans). Also, a questionnaire was designed and administered to ascertain perceptions and attitudes of school personnel about the bilingual program components. There are 24 tables. (BO)

ED 054883

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

BILINGUAL/BICULTURAL EDUCATION -- AN EFFECTIVE LEARNING SCHEME FOR FIRST GRADE AND SECOND GRADE SPANISH SPEAKING, ENGLISH SPEAKING, AND AMERICAN INDIAN CHILDREN IN NEW MEXICO

RECEIVED
SEP 13 1971
NMSU
E.R.I.C.

A Report of Statistical Findings

and Recommendations

for

The Grants Bilingual Education Project

Grants, New Mexico

Southwestern Cooperative Education Laboratory
117 Richmond, NE
Albuquerque, New Mexico 87106

by

Dr. Atilano A. Valencia

August 1971

PC 005526

PREFACE

The 1970-71 Grants Evaluation Plan was undertaken by the Related Programs for Mexican Americans, a Research and Evaluation Division of the Southwestern Cooperative Educational Laboratory. The evaluation plan was designed and coordinated by Dr. Atilano Valencia, Director of the Division. Assisting Dr. Valencia in the field testing were Mr. Tony Galaz and Dr. Max Luft, SWCEL staff members. Additionally, Cecilio Orozco, doctoral student at the University of New Mexico, and Gil Villarreal, Teacher, Acoma Elementary School, Albuquerque Public Schools, provided consultancy assistance in interviewing and distributing questionnaires among the Grants School District personnel. Dick Lentz and Linda Korka, SWCEL staff members, supervised some of the computer data processing.

The statistical design, interpretation of data, and composition of the report also was completed by Dr. Valencia.

I. INTRODUCTION

The Grants Bilingual Program is designed to carry out five major bilingual/bicultural education objectives. The first objective is to facilitate the learning process by using the child's native language to introduce first grade curriculum concurrently with his learning to communicate in a second language--English. The second objective is to provide a communication arts program in the child's native language that serves to reinforce and further develop his ability to communicate in his first language. Since non-Spanish speaking children (Spanish surnamed, Indian, and Anglo) also populate the Grants schools, the Spanish communication arts program has been offered to a large percentage of these children.* Additionally, special emphasis is given to the child's culture and native language as a means to reinforce a positive attitude toward himself and his cultural heritage.

In general, the Grants Bilingual Program can be viewed as a vehicle for teachers to gain an understanding and positive attitude toward the various cultural groups existing in the school system and to involve pupils in activities that will enhance their academic achievement and aspirations. Specifically, the program's general objectives are:

1. To help students learn communicative skills in their native language and a second language.

---

*Except in the schools where the Indian is presented with the Indian-dialect/English bilingual component.

2. To help students become proficient in two languages, which will, in turn, facilitate their educational development and academic/vocational aspirations.

3. To help students learn subject matter concepts in two languages; particularly in social science, science, and mathematics.

4. To help students maintain or develop a positive self-concept by studying their cultural heritage (history and cultural aspects).

5. To help students recognize the advantages of living in a multicultural environment.

6. To help students understand and form positive attitudes toward their own cultural heritage, as well as those of other ethnic groups in the community.

7. To provide fine arts activities which will acquaint students with the music and art of the various cultures represented in the school setting.

8. To develop a teacher and teacher aide preservice and in-service educational component which will improve services, materials, cultural awareness, teaching strategies, and content.

9. To develop effective liaison between the school and the Spanish and Indian speaking parents, and, therefore, increase parental participation and support in the bilingual/bicultural program.

10. To provide an ongoing evaluation component which will serve as an assessment of program effectiveness, as well as feedback for future program revisions.

II. DESCRIPTION OF THE PROGRAM

The Grants Bilingual/Bicultural program provides for the linguistic needs of pupils with linguistic limitations in Spanish and English, pupils functional only in Spanish, pupils functional only in English, pupils functional in the Keresan language and limited in English, pupils functional only in the Keresan language, and pupils functional only in the Navajo language.

Pupils with linguistic limitations in Spanish and English receive basic instruction in both languages. Spanish is used to clarify concepts presented in English. The communications arts also are furthered in the two languages.

While few pupils are functional only in Spanish in the Grants' schools, the utilization of bilingual teachers makes it possible for this type of student to receive instruction in his native language until he is prepared to use the second language (English) in the learning process.

Spanish is presented as a second language for the monolingual English speaking child. Here, the curriculum is presented principally in English while the child learns to communicate in Spanish.

Pupils functional in Keresan with limited English, and pupils functional only in Keresan are provided with a program in English as a Second Language. In the curriculum, the Keresan language is used to clarify concepts.

ESL techniques are used with pupils functional in the Navajo language. The Navajo language also is used to reinforce a d clarify

concepts. Navajo instructional materials, available locally and/or near the school are utilized. The materials have been selected and/or are developed by the teachers, with special reference to the cultural heritage of the Navajo people.

The Grants Bilingual Program was offered for the first time in the 1969-70 school year. Six schools were included in the program representing at least four cultural and language references. The following samples of the total district first grade population were selected for experimental and control group conditions.

School	Treatment Condition	Bilingual Components	Sample n	Percentage of Ethnic Population		
				Anglo Amer.	Mex. Amer.	Amer. Ind.
Cubero	Experimental	Keresan/English Spanish/English	31	4	38	58
Seboyeta	Experimental	Spanish/English	17	3	64	33
San Mateo	Experimental	Spanish/English	10		100	
San Rafael	Experimental	Spanish/English	26	26	72	2
Sierra Vista	Experimental	Spanish/English	51	15	68	17
Fence Lake	Experimental	Navajo/English	12			100
Sierra Vista	Control	English	35	10	68	22

Except for the Fence Lake school and Sierra Vista school (control), the foregoing conditions and population groups are found in the second grade 1970-71 bilingual program. The experimental group "n" is the only factor that has changed to a small degree. Otherwise, the bilingual/bicultural components are offered at a more advanced level to second grade students in the Grants School District. Additionally,

the same program components, relative to the first grade level, are offered in the aforementioned schools in terms of their respective ethnic group compositions.

III. EVALUATION DESIGN

Statistical Design

The evaluation design was conceptualized to determine program effects in English language development, Spanish language development, cultural perceptions and attitudes, and academic achievement in science, mathematics, and social science. The various variables and measuring instruments relative to these general areas are described in greater detail in subsequent paragraphs.

A pre-test versus post-test measure was used to ascertain significant experimental group gains in terms of an eight month period. Analyses of variance were performed to provide probability gain measures for each experimental group and in relationship to all of the given language, cultural, and subject-matter variables. Additionally, a percentage gain factor was used to facilitate interpretation of the statistical comparisons. Statistical analyses are based on data collected from several test instruments administered to first and second graders in the Cubero, Seboyeta, San Mateo, San Rafael, and Sierra Vista elementary schools.

Test Instruments and Related Variables

The SWCEL Test of Oral English Production was used to measure oral English proficiency of first grade children in the program. Three linguistic areas are covered by this test: pronunciation, structure, and vocabulary. It is designed for particular application with children with limited or no English speaking ability. Consequently, the instrument has greater relevancy for non-English speaking children who have not been provided with an English as a Second Language program.

However, it can be used to ascertain the degree of oral language development based on a pre-test versus post-test measure.

The California Achievement Test was administered to first grade and second grade students to ascertain their achievement level in reading vocabulary, reading comprehension, arithmetical reasoning, arithmetic fundamentals, mechanics of English, and spelling. This test also was used in a pre-test versus post-test plan. In reference to the statistical analyses, the data from the California Achievement Test have been interpreted in terms of a probability gain measure and a percentage gain measure, as well as a grade placement factor.

The Test of Basic Experiences (TOBE) published by CTB/McGraw-Hill of Monterey, Calif., was used to measure the proficiency level of students in Spanish language development, science concepts (in Spanish), social studies concepts (in Spanish), and Mathematical concepts (in Spanish). In essence, the TOBE instrument was used to ascertain the comprehension of concepts in three given subject-matter areas, using Spanish as the language medium. Additionally, the TOBE provides a Spanish language measure, with particular reference to first and second grade students in the Spanish/English bilingual program component. The results from this test also are given in terms of analysis of variance, using a pre-test/post-test comparison.

The Caldwell Test was given to first grade students in the program to determine pupil responses in personal social functions, associative vocabulary, concept activation in personal social functions, associative vocabulary, concept activation--numerical and concept activation--sensory. Specifically, this test provides a measure of a child's

ability to provide responses relative to questions about himself and other role activities presented in the test content. Part 2 of the test pertains to associative vocabulary about objects, people and concepts (i.e., hot and cold) in his environment. Parts 3 and 4 refer to arithmetic (numerical and sensory) concepts. This test component also is designed to elicit and measure the child's responses to given stimuli in the testing process. This instrument is especially applicable for pre-school and early first grade students. However, in the Grants evaluation program the test was administered in Spanish to ascertain the degree of Spanish proficiency in relationship to the given test concepts. Thus, the test was administered to first grade students in the Spanish/English bilingual program. In terms of this test instrument, analysis of variance also was applied to ascertain experiment group mean difference using a pre-test versus post-test comparison.

The Cultural Sensitivity Instrument, designed by the author of this report, measures the child's perceptions or attitudes toward relationships between three American cultral groups (Anglo American, American Indian, and Mexican American). It is pictorial and manipulatory in nature and gives a quantitative attitudinal measure. Nine variables are given in the test. The first category refers to the Mexican American child's perception about Mexican American children's relationship with Mexican Americans, Anglo Americans, and American Indians; the second category pertains to the Anglo American child's perception about Anglo American children's relationship with Mexican Americans, Anglo Americans, and American Indians; and the third category refers

to the American Indian child's perception about American Indian children's relationship with Mexican Americans, Anglo Americans, and American Indians.

The Cultural Sensitivity Test uses a social distance scale as a measuring feature, ranging from 0 to 85 centimeters. The higher the score, the greater is the positive attitude of the child toward his own and/or two other American ethnic groups. Preliminary data from a pilot study indicate that the reliability of the test is beyond .90, in terms of the Pearson r.

The Cultural Sensitivity Test data were examined on a pre-test versus post-test basis, using analysis of covariance to ascertain attitudinal changes among experimental group children over an eight month period. The test was administered individually among a sample of first and second grade students (including the three aforementioned ethnic groups) in the bilingual/bicultural program.

A teacher/administrative questionnaire was designed at SWCEL to be administered to a sample of program and non-program teachers and administrators. This instrument is designed to ascertain teacher and administrative perceptions about the various bilingual program components. The instrument attempts to determine attitudes about the inclusion of the Spanish and Indian languages as media in the instructional program, as well as the presentation of Mexican American and American Indian cultural references in subject matter content and related classroom activities.

All of the testers and raters were trained by the SWCEL in testing methods and procedures relative to each measuring instrument. Rater

reliability has been controlled, as nearly as possible, by training as well as by the nature of the scoring procedures and rating scales incorporated with the instruments.

IV. STATISTICAL FINDINGS

Experimental Group Achievement in Oral English Proficiency, Based on the SWCEL Test of Oral English Production

The SWCEL Test of Oral English Production was used to ascertain the oral English proficiency of first and second grade students in the program. The test was administered to a sample of first and second grade students in each of the program schools. Table I shows the statistical data relative to three ethnic groups in each of the program schools.

The data in Table I must be examined in relationship to two factors: (1) pre-test and post-test means in respect to the maximum possible score in each variable, and (2) conditions and variables where a greater frequency of pre-test and post-test differences tend to occur.

It is noted that all of the ethnic groups in the experimental schools scored relatively close to the maximum possible score (24) in oral English vocabulary. The data consistently show experimental group (pre-test) scores within five points of the maximum score in oral English vocabulary. Thus, achievement gains (pre-test versus post-test) based on a probability measure (F-ratio) and a percentage factor are dependent on experimental group mean variances within the 5 point range, as well as degree of homogeneity in the pre-test and post-test response patterns. For example, Anglo first grade children in San Rafael scored, on the average, two points higher in the post-test as compared to the pre-test. Yet, the homogeneity pattern shows that all of the children reached the peak score in vocabulary relative

to the post-test. While a significant gain is noted at the .05 level of confidence, the mean gain was only two points. However, this finding can still be interpreted as a gain, for it is conceivable that, with all of the children reaching the peak score, higher scores may be realizable in a more advanced vocabulary test. The foregoing phenomenon also is found for the Indian and Mexican American experimental groups in the program schools. However, in reference to the Indian and Mexican American, the group mean scores in (post-test) do not reach the possible maximum score.

Table I shows only one significant difference in English pronunciation, based on a pre-test versus post-test comparison. This difference is noted among the Mexican American first grade students in the Sierra Vista Elementary School. Yet, it also is observed that the mean difference (pre-test versus post-test) is only 2.24. In terms of a raw score comparison, the difference is relatively close. In essence, all of the experimental groups (Anglo American, American Indian, and Mexican American) in the program schools scored within four points of the possible maximum score of 31. Thus, it appears that the experimental group children were consistently scoring near the region of the maximum score in the pre-test and post-test.

Significant gains in oral English structure (.05 and .01 levels of confidence) are found among Mexican first graders in San Mateo, San Rafael, and Sierra Vista. Since the possible maximum score in oral English structure is 171, there is a higher probability that a greater variance will occur between the pre-test scores and post-test scores. While some experimental mean scores were below 100 in the pre-test, all

of the mean scores were beyond 100 in the post-test. And while maximum scores in vocabulary and pronunciation were consistently reached in the pre- and post-test comparisons, the possible maximum score in oral English structure was not attained by any of the experimental groups. Based on this observation, it can be suggested that greater emphasis may be applied in this area of language development in the first year curriculum. Additionally, in reference to the SWCEL Test pronunciation and vocabulary content, it can be concluded that the three aforementioned ethnic groups are prepared to operate at more advanced levels of oral English in the beginning first grade curriculum.

Table II illustrates oral English achievement in Cubero, San Mateo, San Rafael, and Sierra Vista by grade level (first and second), with the three ethnic groups combined. And Table III shows oral English achievement of each ethnic group (Anglo American, American Indian, and Mexican American) by grade level and across all of the experimental groups. The statistical data in these tables show similar results as compared to the data given in Table I. In essence, the experimental groups scored slightly higher in the post-test (vocabulary and pronunciation) as compared to the pre-test; however, all of the means are relatively close to the region of the possible maximum score. Greater gains again are apparent in English structure. As was previously explicated, the test component allows for a greater variance in terms of a possible maximum score. While the pre-test mean scores on this variable are within 20 points (plus or minus) of 100, the possible maximum score is 171. Thus, there is a greater probability for significant mean achievement gains relative to this

variable. And while the maximum score on this variable was not reached by any of the experimental groups, significant gains are consistently noted (.05 or .01 level of confidence) in the majority of the comparisons.

Table IV illustrates the comparative difference between experimental groups among the several program schools, using the SWCEL Test variables and analysis of covariance. In this statistical treatment, a comparative analysis was performed only with reference to Mexican American children. Due to the low "n" relative to the Anglo American and Mexican American children in some of the schools, a similar comparative analysis was not performed for these two ethnic groups. In reference to Table IV, the findings show a very close similarity in mean scores for Mexican American children relative to oral English proficiency (vocabulary, pronunciation, and structure) across all of the experimental schools. While a significant difference (.01 level of confidence) is noted in the San Rafael/Sierra Vista comparison in pronunciation, the mean variance is only 1.25. Thus, it can be concluded that program effects in oral English development do not appear to vary significantly among experimental children in the Grants bilingual project schools.

TABLE I

EXPERIMENTAL GROUP ACHIEVEMENT IN ORAL ENGLISH BY ETHNIC GROUP, GRADE LEVEL AND SCHOOL, BASED ON THE SWCEL TEST AND ANALYSIS OF VARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Vocabulary	San Rafael 1st	Anglo	7	22.00	2.07	5.60*	9.09
		Amer.	7	24.00	0.00		
Pronunciation			7	28.00	3.63	.50	4.08
			7	29.14	1.55		
Structure			7	112.57	11.36	.86	7.74
			7	121.29	20.01		
Total			7	162.57	14.79	1.30	7.29
			7	174.43	20.71		
Vocabulary	Cubero 1st	Amer.	20	22.25	1.58	3.46	3.37
		Indian	20	23.00	0.77		
Pronunciation			20	29.80	1.60	.91	1.68
			20	30.30	1.62		
Structure			20	86.15	23.05	2.67	14.97
			20	99.05	25.52		
Total			20	138.20	23.91	2.94	10.24
			20	152.35	26.87		
Vocabulary	Cubero 1st	Mex.	10	22.60	1.43	1.54	3.10
		Amer.	10	23.30	0.90		
Pronunciation			10	30.10	0.83	.27	.66
			10	30.30	0.78		
Structure			10	105.50	21.50	1.83	12.42
			10	118.60	19.72		
Total			10	158.20	21.92	1.95	8.85
			10	172.20	20.55		

TABLE I (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Vocabulary	San Mateo 1st	Mex.	10	21.60	1.62	11.68**	9.26
		Amer.	10	23.60	.66		
Pronunciation			10	27.80	2.99	2.17	5.76
			10	29.40	1.28		
Structure			10	84.20	15.88	9.72**	28.62
			10	108.30	16.90		
Total			10	133.60	14.79	12.71**	20.73
			10	161.30	18.02		
Vocabulary	San Rafael 1st	Mex.	21	22.62	1.56	3.29	3.37
		Amer.	21	23.38	1.05		
Pronunciation			21	29.24	1.54	.51	-1.79
			21	28.71	2.86		
Structure			21	98.71	13.87	4.73*	13.51
			21	112.05	23.62		
Total			21	150.57	15.56	4.08*	9.01
			21	164.14	25.69		
Vocabulary	Sierra Vista-1st	Mex.	24	21.29	2.35	12.14**	9.00
		Amer.	24	23.21	1.19		
Pronunciation			24	27.96	1.99	21.34**	8.05
			24	30.21	1.22		
Structure			24	82.25	15.25	10.41**	22.14
			24	100.46	22.35		
Total			24	131.50	17.15	13.77**	17.02
			24	153.88	23.28		
Vocabulary	Seboyeta 2nd	Mex.	5	21.20	1.83	5.75	11.32
		Amer.	5	23.60	.80		
Pronunciation			5	28.60	1.36	.20	1.40
			5	29.00	1.10		
Structure			5	90.20	14.47	.65	13.08
			5	102.00	25.32		

TABLE I (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Total	Seboyeta 2nd	Mex.	5	140.00	13.48	.97	10.43
		Amer.	5	154.60	26.36		
Vocabulary	Sierra Vista-2nd	Mex.	17	20.35	2.61	10.80**	11.56
		Amer.	17	22.71	1.18		
Pronunciation			17	29.35	1.61	.00	.00
			17	29.35	1.41		
Structure			17	90.88	20.12	.03	-1.49
			17	90.24	19.15		
Total			17	140.59	22.59	.23	2.64
			17	144.29	20.79		

TABLE II

EXPERIMENTAL GROUP ACHIEVEMENT IN ORAL ENGLISH
BY SCHOOL AND GRADE LEVEL (ETHNIC GROUPS COMBINED),
BASED ON THE SWCEL TEST AND ANALYSIS OF VARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Vocabulary	Cubero 1st	All	31 31	22.42 23.13	1.54 .83	4.92*	3.17
Pronunciation			31 31	29.90 30.29	1.38 1.37	1.18	1.29
Structure			31 31	92.71 106.00	23.86 25.17	4.40*	14.34
Total			31 31	145.03 159.42	24.71 26.32	4.76*	9.92
Vocabulary	San Mateo 1st	All	10 10	21.60 23.60	1.62 .66	11.68**	9.26
Pronunciation			10 10	27.80 29.40	2.99 1.28	2.17	5.76
Structure			10 10	84.20 108.30	15.88 16.90	9.72**	28.62
Total			10 10	133.60 161.30	14.79 18.02	12.71**	20.73
Vocabulary	San Rafael 1st	All	29 29	22.45 23.55	1.69 .93	9.12**	4.92
Pronunciation			29 29	28.93 28.79	2.27 2.56	.04	-.48
Structure			29 29	103.41 114.93	15.75 22.92	4.80*	11.14
Total			29 29	154.79 167.28	17.21 24.69	4.81*	8.06

TABLE II (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Vocabulary	Sierra Vista-1st	All	24 24	21.29 23.21	2.35 1.19	12.14**	9.00
Pronunciation			24 24	27.96 30.21	1.99 1.22	21.34**	8.05
Structure			24 24	82.25 100.46	15.25 22.35	10.41**	22.14
Total			24 24	131.50 153.88	17.15 23.28	13.77	17.02
Vocabulary	Seboyeta 2nd	All	7 7	21.29 23.57	1.58 .73	10.37**	10.74
Pronunciation			7 7	28.71 29.14	1.16 .99	.47	1.49
Structure			7 7	93.14 101.57	15.21 22.28	.58	9.05
Total			7 7	143.14 154.29	14.51 23.26	.99	7.78
Vocabulary	Sierra Vista-2nd	All	18 18	20.39 22.72	2.54 1.46	11.90**	11.44
Pronunciation			18 18	29.33 29.39	1.56 1.38	.01	.19
Structure			18 18	91.94 92.39	20.03 18.62	.00	.48
Total			18 18	141.67 144.50	22.40 20.22	.14	2.00

TABLE III

EXPERIMENTAL GROUP ACHIEVEMENT IN ORAL ENGLISH
BY ETHNIC GROUP AND GRADE LEVEL (ALL SCHOOLS COMBINED),
BASED ON THE SWCEL TEST AND ANALYSIS OF VARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Vocabulary	All - 1st	Anglo	8	22.25	2.05	5.11*	7.87
		Amer.	8	24.00	.00		
Pronunciation			8	28.25	3.46	.49	3.54
			8	29.25	1.48		
Structure			8	110.50	11.96	1.56	9.50
			8	121.00	18.73		
Total			8	161.00	14.45	2.10	8.23
			8	174.25	19.38		
Vocabulary	All - 1st	Amer.	24	20.83	4.12	2.26	7.00
		Indian	24	22.29	2.15		
Pronunciation			24	29.00	2.53	.93	2.30
			24	29.67	2.13		
Structure			24	77.96	36.67	1.00	14.32
			24	89.13	38.82		
Total			24	127.79	41.62	1.15	10.40
			24	141.08	42.18		
Vocabulary	All - 1st	Mex.	65	21.97	1.98	23.88**	6.23
		Amer.	65	23.34	1.04		
Pronunciation			65	28.68	2.11	6.66*	3.27
			65	29.62	2.01		
Structure			65	91.45	18.52	21.01**	18.32
			65	108.20	22.63		
Total			65	142.09	20.25	23.73**	13.41
			65	161.15	23.87		

TABLE III (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Vocabulary	All - 2nd	Amer.	5	19.00	2.76	7.07*	29.00
		Indian	5	22.80	.75		
Pronunciation			5	25.00	3.63	1.21	9.60
			5	27.40	2.42		
Structure			5	65.40	30.62	.00	.00
			5	65.40	30.45		
Total			5	109.40	35.40	.06	5.67
			5	115.60	33.18		
Vocabulary	All - 2nd	Mex.	22	20.55	2.48	15.61**	11.50
		Amer.	22	22.91	1.16		
Pronunciation			22	29.18	1.59	.03	.31
			22	29.27	1.35		
Structure			22	90.73	18.98	.36	4.11
			22	94.45	21.11		
Total			22	140.45	20.87	.84	4.40
			22	146.64	22.59		

TABLE IV

EXPERIMENTAL GROUP DIFFERENCES IN ORAL ENGLISH ACHIEVEMENT, BASED ON THE SWCEL TEST AND ANALYSIS OF COVARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Vocabulary	Cubero-1st	Mex.	10	22.60	23.30	23.13	.90	4.22
	San Mateo-1st	Amer.	10	21.60	23.60	23.77	.66	
Pronunciation			10	30.10	30.30	30.19	.78	1.40
			10	27.80	29.40	29.51	1.28	
Structure			10	105.50	118.60	111.81	19.72	.18
			10	84.20	108.30	115.09	16.90	
Total			10	158.20	172.20	163.72	20.55	.53
			10	133.60	161.30	169.78	18.02	
Vocabulary	Cubero-1st	Mex.	10	22.60	23.30	23.30	.90	.04
	San Rafael-1st	Amer.	21	22.62	23.38	23.38	1.05	
Pronunciation			10	30.10	30.30	29.62	.78	.58
			21	29.23	28.71	29.04	2.86	
Structure			10	105.50	118.60	114.73	19.72	.01
			21	98.71	112.05	113.89	23.62	
Total			10	158.20	172.20	167.53	20.55	.02
			21	150.57	164.14	166.37	25.69	
Vocabulary	Cubero-1st	Mex.	10	22.60	23.30	22.97	.90	1.27
	Sierra Vista	Amer.	24	21.29	23.21	23.35	1.19	

TABLE IV (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Pronunciation	Cubero-1st	Mex.	10	30.10	30.30	30.12	.78	.10
	Sierra Vista	Amer.	24	27.96	30.21	30.28	1.22	
Structure			10	105.50	118.60	103.35	19.72	.26
			24	82.25	100.46	106.81	22.35	
Total			10	158.20	172.20	154.49	20.55	1.04
			24	131.50	153.88	161.25	23.28	
Vocabulary	San Mateo-1st	Mex.	10	22.60	23.60	23.77	.66	1.75
	San Rafael-1st	Amer.	21	22.62	23.38	23.30	1.05	
Pronunciation			10	27.80	29.40	29.96	1.28	2.77
			21	29.24	28.71	28.45	2.86	
Structure			10	84.20	108.30	117.36	16.90	1.60
			21	98.71	112.05	107.73	23.62	
Total			10	133.60	161.30	173.47	18.02	3.82
			21	150.57	164.14	158.35	25.69	
Vocabulary	San Mateo-1st	Mex.	10	21.60	23.60	23.53	.66	.84
	Sierra Vista	Amer.	24	21.29	23.21	23.24	1.19	
Pronunciation			10	27.80	29.40	29.42	1.28	2.77
			24	27.96	30.21	30.20	1.22	
Structure			10	84.20	108.30	106.90	16.90	1.15
			24	82.25	100.46	101.04	22.35	
Total			10	133.60	161.30	159.71	18.02	1.04
			24	131.50	153.86	154.54	23.28	

TABLE IV (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Vocabulary	San Rafael-1st	Mex.	21	22.62	23.38	23.16	1.05	.70
	Sierra Vista	Amer.	24	21.29	23.21	23.41	1.19	
Pronunciation			21	29.24	28.71	28.32	2.86	12.83**
			24	27.96	30.21	30.55	1.22	
Structure			21	98.71	112.05	102.06	23.62	1.61
			24	82.25	100.46	109.19	22.35	
Total			21	150.57	164.14	152.40	25.69	4.56*
			24	131.50	153.86	164.15	23.28	
Vocabulary	Seboyeta-1st	Mex.	5	21.20	23.60	23.45	.80	1.79
	Sierra Vista	Amer.	17	20.35	22.71	22.75	1.18	
Pronunciation			5	28.60	29.00	28.90	1.09	.43
			17	29.35	29.35	29.38	1.41	
Structure			5	90.20	102.00	102.49	25.32	3.02
			17	90.88	92.24	92.09	19.15	
Total			5	140.00	154.60	154.99	26.36	2.36
			17	140.59	144.29	144.18	20.79	

Experimental Group Achievement in Spanish, Science and Social Science Concepts, Based on the TOBE Test--Spanish Language version

Experimental group achievement in language development, science concepts, and social studies concepts with Spanish as an instructional medium was noted through analysis of variance, based on the Test of Basic Experiences.

Table V presents the statistical findings relative to the three given variables for each of the ethnic groups (first grade Anglo Americans, American Indians, and Mexican Americans) in the various experimental schools. As may be expected, the greatest gains on these variables are found among the Mexican American students in the bilingual program. Small gains, not significant at the .05 level of confidence, were noted among the Anglo American and American Indian students. The most consistent gains among Mexican American first graders, given in percentage terms, are noted in Cubero, San Mateo, San Rafael, and Sierra Vista. Significant gains, based on probability statistics, are found among the Mexican American students in San Mateo relative to science and social studies (.01 level of confidence), in San Rafael relative to language (.01 level of confidence), and in Sierra Vista relative to language (.01 level of confidence).

A maximum score of 28 is possible in each of the variables of the TOBE instrument. None of the experimental groups surpassed the medium point reference relative to the maximum score. This illustrates that, while significant gains are noted (based on probability statistics), test results do not reveal dramatic gains among the first grade experimental groups in terms of language, science concepts, and social science concepts.

Table V also presents the achievement of second grade experimental students in the three aforementioned variables measured by the TOBE instrument. The data again reveal higher scores among Mexican American students as compared to the two other ethnic groups. However, this may be expected due to the Spanish language reference found among Mexican American children in the Grants area. Pre-test scores among Mexican American second graders have a close similarity to the post-test scores found among Mexican American first graders. While the post-test scores for the first grade children (in the majority of the comparisons) appear to be three to four points higher than the pre-test scores, the post-test scores among the second grade Mexican American children appear to be (in the majority of the comparisons) one to three points higher as compared to the pre-test scores. Significant gains, based on probability statistics, are noted in San Mateo relative to language (.05 level of confidence), in Seboyeta relative to social studies (.05 level of confidence), and in Sierra Vista relative to language, science concepts and social science concepts (.01 level of confidence).

Table VI shows the statistical data for experimental group achievement (ethnic groups combined) in the various schools relative to language, science concepts, and social studies concepts measured by the TOBE. This component of the statistical findings simply serves to identify the schools and variables where the greatest achievement gains have occurred, with specific reference to all experimental groups (all ethnic groups combined). Based on probability statistics, significant gains are found among the first grade students in San Mateo relative to science concepts and social studies, in San Rafael relative to language,

and in Sierra Vista relative to language--all at the .05 or .01 level of confidence. Significant gains also are noted among the second grade students in San Mateo relative to language, in Seboyeta relative to science concepts, and in Sierra Vista relative to language, science concepts and social studies concepts. Significant gains are noted at the .05 level of confidence for the San Mateo and Seboyeta experimental groups, and at the .01 level of confidence for the Sierra Vista experimental group.

Close scrunity of the data shows higher pre-test means for the San Mateo and Seboyeta experimental groups as compared to the Sierra Vista experimental group. This may suggest that, on the average, the children in San Mateo and Seboyeta have a higher proficiency level in Spanish in entering school as compared to the Sierra Vista children. In other terms, it is evident that a greater number of non-English speaking, beginning first graders are found in the Sierra Vista school as compared to the two other schools. The important phenomenon in the Sierra Vista school is, of course, the achievement gain noted in each of the three variables measured by the TOBE test.

Table VII illustrates experimental group achievement in the three TOBE Test variables across all of the schools, with particular reference to each ethnic group. Significant gains, based on probability statistics, are found among the first grade American Indian children in language (.05 level of confidence), and among the Mexican American children in language, science concepts and social science concepts. The pre-test and post-test mean scores among Anglo American children relative to the three given variables are very closely related. It must

be emphasized that the TOBE test was administered in Spanish; consequently, Anglo American students would not be expected to measure as high as children with a Spanish speaking language reference.

Table VII also shows experimental group achievement in the three TOBE test variables for second grade children, with particular reference to each ethnic group. Significant gains are found among Mexican American second grade students in language, science concepts, and social studies concepts. Based on probability statistics, the significant gains are at the .05 level of confidence in language and at the .01 level of confidence in science concepts and social studies concepts. Both pre-test and post-test means are found to be higher for Mexican American children as compared to Anglo American and American Indian children. The language medium (Spanish) in the test appears to be a significant element in measuring achievement on the three TOBE test variables. The most significant finding in this statistical analysis relates to the fact that all of the children in the bilingual program are able to learn language, science and social studies concepts (in varying degrees) in Spanish. With this phenomenon occurring among children, it can be concluded that the Grants Bilingual Program is attaining one of its major objectives--enhancing the ability of children to function academically in more than one language. Additionally, a second language is being learned by the non-English speaking child, while, at the same time, the Mexican American child's Spanish speaking ability is being furthered. Further study is needed on a yearly and longitudinal basis to ascertain further progress among experimental group children in Spanish language development and ability to utilize Spanish in other subject-

matter content. In this respect, it is strongly recommended that these variables be given continuous attention in future evaluation studies.

Table VIII provides statistical comparisons of experimental groups in different pairs of schools, based on the TOBE test variables and analysis of covariance. Significant differences between experimental school groups, based on probability statistics, are noted as follows:

(1) Between San Mateo and San Rafael Mexican American first graders, a significant difference in science concepts in favor of San Mateo at the .05 level of confidence;

(2) Between San Mateo and San Rafael Mexican American first graders, a significant difference in social studies concepts in favor of San Mateo at the .01 level of confidence;

(3) Between San Mateo and Sierra Vista Mexican American first graders, a significant difference in social studies concepts in favor of San Mateo at the .01 level of confidence;

(4) Between Cubero and Seboyeta American Indian second graders, a significant difference in science concepts in favor of Seboyeta at the .01 level of confidence;

(5) Between Cubero and San Mateo Mexican American second graders, a significant difference in language in favor of San Mateo at the .01 level of confidence;

(6) Between Cubero and San Mateo Mexican American second graders, a significant difference in social studies in favor of San Mateo at the .01 level of confidence;

(7) Between Cubero and San Rafael Mexican American second graders, a significant difference in social studies concepts in favor of Cubero at the .01 level of confidence:

(8) Between Cubero and Seboyeta Mexican American second graders, a significant difference in science concept in favor of Seboyeta at the .05 level of confidence;

(9) Between San Mateo and San Rafael Mexican American second graders, a significant difference in language in favor of San Mateo at the .01 level of confidence;

(10) Between San Mateo and San Rafael Mexican American second graders, a significant difference in social studies in favor of San Mateo at the .01 level of confidence;

(11) Between San Rafael and Seboyeta Mexican American second graders, a significant difference in social studies in favor of Seboyeta at the .01 level of confidence;

(12) Between San Rafael and Sierra Vista Mexican American second graders, a significant difference in language in favor of Sierra Vista at the .05 level of confidence;

(13) Between San Rafael and Sierra Vista Mexican American second graders, a significant difference in science concepts in favor of Sierra Vista at the .05 level of confidence; and

(14) Between San Rafael and Sierra Vista Mexican American second graders, a significant difference in social studies in favor of Sierra Vista at the .01 level of confidence.

The foregoing findings indicate fourteen significant differences between pairs of project schools relative to the three TOBE variables.

The ethnic group variable was held constant in these comparisons; thus, achievement may be viewed as relative to the program and other related curricular/instructional or environmental conditions in each of the schools. Further study is suggested to clearly identify program or other variables that tend to affect differences in mean achievement, measured by the TOBE, between the schools in the bilingual program. Further observations may be worthwhile only where significant mean differences between pairs of experimental groups are consistently found.

TABLE V

EXPERIMENTAL GROUP ACHIEVEMENT IN SPANISH
BY ETHNIC GROUP, GRADE LEVEL AND SCHOOL, BASED
ON THE TOBE TEST AND ANALYSIS OF VARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Language	San Rafael 1st	Anglo	5	9.60	3.07	1.50	27.08
		Amer.	5	12.20	2.93		
Science			5	8.40	1.36	2.66	19.20
			5	10.00	1.41		
Social Studies			5	8.60	3.14	0.00	0.00
			5	8.60	2.06		
Language	Cubero 1st	Amer.	19	10.11	3.71	2.36	19.27
		Indian	19	12.05	3.89		
Science			19	9.63	2.72	1.26	10.93
			19	10.68	2.88		
Social Studies			19	8.58	2.82	1.95	18.40
			19	10.16	3.87		
Language	Cubero 1st	Mex.	7	14.43	3.16	2.63	21.78
		Amer.	7	17.57	3.54		
Science			7	12.14	3.36	3.66	28.24
			7	15.57	2.82		
Social Studies			7	13.57	3.02	1.47	17.89
			7	16.00	3.85		
Language	San Mateo 1st	Mex.	11	15.18	3.33	1.13	9.58
		Amer.	11	16.64	2.74		
Science			11	12.00	2.09	11.99**	27.27
			11	15.27	2.14		
Social Studies			11	11.27	2.26	40.74**	59.68
			11	18.00	2.45		
Language	San Rafael 1st	Mex.	19	11.89	3.14	17.23**	32.74
		Amer.	19	15.79	2.44		
Science			19	11.05	2.93	1.30	10.95
			19	12.26	3.40		

TABLE V (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Social Studies	San Rafael 1st	Mex.	19	11.79	3.86	2.61	17.86
		Amer.	19	13.89	3.95		
Language	Sierra Vista 1st	Mex.	21	12.00	4.05	5.44*	27.38
		Amer.	21	15.29	4.82		
Science			21	10.62	3.90	2.24	17.04
			21	12.43	3.74		
Social Studies			21	12.19	4.80	.75	12.11
			21	13.67	5.89		
Language	San Rafael 2nd	Anglo	8	12.13	2.89	2.70	-21.65
		Amer.	8	9.50	3.08		
Science			8	9.75	2.54	1.08	-11.54
			8	8.63	1.32		
Social Studies			8	10.63	3.74	.28	9.41
			8	11.63	3.24		
Language	Sierra Vista 2nd	Anglo	7	7.86	7.52	1.14	36.36
		Amer.	7	10.71	4.74		
Science			7	8.29	1.75	.60	15.52
			7	9.57	3.66		
Social Studies			7	9.57	2.56	.55	11.94
			7	10.71	2.76		
Language	Cubero 2nd	Amer. Indian	13	10.92	2.02	.02	1.41
			13	11.08	2.87		
Science			13	8.62	2.90	.12	-4.46
			13	8.23	2.42		
Social Studies			13	8.54	3.10	.98	13.51
			13	9.69	2.55		
Language	Seboyeta 2nd	Amer. Indian	6	11.17	.90	2.39	13.43
			6	12.67	1.97		
Science			6	10.67	2.05	3.06	21.88
			6	13.00	2.16		
Social Studies			6	11.00	2.00	.15	6.06
			6	11.67	3.14		

TABLE V (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Language	Cubero 2nd	Mex. Amer.	8 8	14.63 15.63	2.12 2.74	.58	6.84
Science			8 8	12.38 12.88	2.50 3.62	.09	4.04
Social Studies			8 8	12.00 14.13	3.00 1.90	2.50	17.71
Language	San Mateo 2nd	Mex. Amer.	8 8	19.63 22.13	2.23 1.69	5.57*	12.74
Science			8 8	15.88 16.50	2.20 1.22	.42	3.94
Social Studies			8 8	16.13 19.63	3.76 3.04	3.67	21.71
Language	San Rafael 2nd	Mex. Amer.	13 13	16.38 16.38	4.53 4.09	.00	.00
Science			13 13	15.00 14.15	4.24 4.72	.21	-5.64
Social Studies			13 13	19.00 16.08	5.41 4.86	1.94	-15.38
Language	Seboyeta 2nd	Mex. Amer.	16 16	17.00 17.19	3.81 3.54	.01	1.10
Science			16 16	14.94 17.38	3.67 3.08	3.88	16.32
Social Studies			16 16	14.38 17.81	3.81 3.68	6.32*	23.91
Language	Sierra Vista 2nd	Mex. Amer.	54 54	14.15 16.87	4.21 4.33	10.76**	19.24
Science			54 54	10.56 13.00	3.74 4.16	10.11**	23.16
Social Studies			54 54	11.72 15.17	4.68 4.78	14.05**	29.38

TABLE VI

EXPERIMENTAL GROUP ACHIEVEMENT IN SPANISH
BY SCHOOL AND GRADE LEVEL (ETHNIC GROUPS COMBINED),
BASED ON THE TOBE TEST AND ANALYSIS OF VARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Language	Cubero 1st	All	27	11.26	3.98	3.47	19.41
			27	13.44	4.46		
Science			27	10.37	3.07	3.01	15.36
			27	11.96	3.53		
Social Studies			27	9.85	3.58	2.64	18.80
			27	11.70	4.57		
Language	San Mateo 1st	All	11	15.18	3.33	1.13	9.58
			11	16.64	2.74		
Science			11	12.00	2.09	11.99**	27.27
			11	15.27	2.14		
Social Studies			11	11.27	2.26	40.74**	59.68
			11	18.00	2.45		
Language	San Rafael 1st	All	24	11.42	3.26	15.67**	31.75
			24	15.04	2.94		
Science			24	10.50	2.89	2.04	12.30
			24	11.79	3.23		
Social Studies			24	11.13	3.94	1.91	14.98
			24	12.79	4.22		
Language	Sierra Vista 1st	All	21	12.00	4.05	5.44*	27.38
			21	15.29	4.82		
Science			21	10.62	3.90	2.24	17.04
			21	12.43	3.74		
Social Studies			21	12.19	4.80	.75	12.11
			21	13.67	5.89		
Language	Cubero 2nd	All	21	12.33	2.73	.22	3.86
			21	12.81	3.58		
Science			21	10.05	3.30	.00	-.47
			21	10.00	3.70		

TABLE VI (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Social Studies	Cubero	All	21	9.86	3.50	2.08	15.46
	2nd		21	11.38	3.17		
Language	San Mateo	All	8	19.63	2.23	5.57*	12.74
	2nd		8	22.13	1.69		
Science			8	15.88	2.20	.42	3.94
			8	16.50	1.22		
Social Studies			8	16.13	3.76	3.67	21.71
			8	19.63	3.04		
Language	San Rafael	All	21	14.76	4.49	.44	-6.77
	2nd		21	13.76	5.01		
Science			21	13.00	4.48	.43	-7.33
			21	12.05	4.65		
Social Studies			21	15.81	6.32	.64	-9.04
			21	14.38	4.83		
Language	Seboyeta	All	22	15.41	4.19	.19	3.54
	2nd		22	15.95	3.77		
Science			22	13.77	3.81	4.59*	17.49
			22	16.18	3.46		
Social Studies			22	13.45	3.73	4.45*	19.93
			22	16.14	4.48		
Language	Sierra Vista	All	65	13.57	4.68	8.24**	17.69
	2nd		65	15.97	4.77		
Science			65	10.28	3.55	8.81**	20.06
			65	12.34	4.27		
Social Studies			65	11.31	4.49	14.99**	27.89
			65	14.46	4.72		

TABLE VII

EXPERIMENTAL GROUP ACHIEVEMENT IN SPANISH BY ETHNIC GROUP AND GRADE LEVEL (ALL SCHOOLS COMBINED), BASED ON THE TOBE TEST AND ANALYSIS OF VARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Language	All-1st	Anglo	6	9.83	2.85	1.51	22.03
		Amer.	6	12.00	2.71		
Science			6	9.00	1.83	1.32	12.96
			6	10.17	1.34		
Social Studies			6	8.50	2.87	.09	5.88
			6	9.00	2.08		
Language	All-1st	Amer.	23	10.39	4.50	4.12*	25.52
		Indian	23	13.04	4.15		
Science			23	10.13	3.44	2.79	18.45
			23	12.00	3.96		
Social Studies			23	9.96	3.97	2.33	23.14
			23	12.26	5.85		
Language	All-1st	Mex.	58	12.86	3.79	19.65**	24.26
		Amer.	58	15.98	3.73		
Science			58	11.21	3.29	10.55**	18.62
			58	13.29	3.56		
Social Studies			58	12.05	3.96	11.35**	23.18
			58	14.84	4.84		
Language	All-2nd	Anglo	15	10.13	4.30	.00	-.66
		Amer.	15	10.07	3.99		
Science			15	9.07	2.32	.00	.00
			15	9.07	2.72		
Social Studies			15	10.13	3.28	.79	10.53
			15	11.20	3.06		
Language	All-2nd	Amer.	27	12.93	3.78	.08	2.58
		Indian	27	13.26	4.33		
Science			27	10.19	3.16	.70	9.45
			27	11.15	4.92		

TABLE VII (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre/post Test Means	St'd Dev.	F Ratio	% Change
Social Studies	All-2nd	Amer.	27	10.89	4.90	1.32	15.31
		Indian	27	12.56	5.52		
Language	All-2nd	Mex.	99	15.38	4.28	8.80*	11.69
		Amer.	99	17.18	4.20		
Science			99	12.42	4.22	7.95**	13.74
			99	14.13	4.25		
Social Studies			99	13.48	5.15	12.95**	18.58
			99	15.99	4.59		

TABLE VIII

EXPERIMENTAL GROUP DIFFERENCES IN KNOWLEDGE OF SPANISH, SCIENCE AND SOCIAL STUDIES CONCEPTS BASED ON THE TOBE TEST AND ANALYSIS OF COVARIANCE

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Language	Cubero-1st	Mexican	7	14.43	17.57	17.87	3.54	1.40
	San Mateo-1st	American	11	15.18	16.64	16.45	2.74	
Science	Cubero-1st	Mexican	7	12.14	15.57	15.54	2.82	.04
	San Mateo-1st	American	11	12.00	15.27	15.29	2.14	
Social Studies	Cubero-1st	Mexican	7	13.57	16.00	15.25	3.85	4.14
	San Mateo-1st	American	11	11.27	18.00	18.48	2.45	
Language	Cubero-1st	Mexican	7	14.43	17.57	16.48	3.54	.08
	San Rafael-1st	American	19	11.89	15.79	16.19	2.44	
Science	Cubero-1st	Mexican	7	12.14	15.57	15.28	2.82	4.00
	San Rafael-1st	American	19	11.05	12.26	12.37	3.40	
Social Studies	Cubero-1st	Mexican	7	13.57	16.00	15.27	3.85	.48
	San Rafael-1st	American	19	11.79	13.89	14.16	3.95	
Language	Cubero-1st	Mexican	7	14.43	17.57	15.96	3.54	.01
	Sierra Vista	American	21	12.00	15.29	15.82	4.82	
Science	Cubero-1st	Mexican	7	12.14	15.57	14.96	2.82	2.94
	Sierra Vista	American	21	10.62	12.43	12.63	3.74	
Social Studies	Cubero-1st	Mexican	7	13.57	16.00	15.34	3.85	.45
	Sierra Vista	American	21	12.19	13.67	13.89	5.89	

TABLE VIII (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Language	San Mateo-1st	Mexican	11	15.18	16.64	15.56	2.74	.98
	San Rafael-1st	American	19	11.89	15.79	16.41	2.44	
Science	San Mateo-1st	Mexican	11	12.00	15.27	15.04	2.14	5.36*
	San Rafael-1st	American	19	11.05	12.26	12.40	3.40	
Social Studies	San Mateo-1st	Mexican	11	11.27	18.00	18.14	2.45	11.79**
	San Rafael-1st	American	19	11.79	13.89	13.81	3.95	
Language	San Mateo-1st	Mexican	11	15.18	16.64	14.96	2.74	.98
	Sierra Vista	American	21	12.00	15.29	16.17	4.82	
Science	San Mateo-1st	Mexican	11	12.00	15.27	14.76	2.14	3.80
	Sierra Vista	American	21	10.62	12.43	12.70	3.74	
Social Studies	San Mateo-1st	Mexican	11	11.27	18.00	18.34	2.45	7.80**
	Sierra Vista	American	21	12.19	13.67	13.49	5.89	
Language	San Rafael-1st	Mexican	19	11.89	15.79	15.83	2.44	.43
	Sierra Vista	American	21	12.00	15.29	15.25	4.82	
Science	San Rafael-1st	Mexican	19	11.05	12.26	12.15	3.40	.15
	Sierra Vista	American	21	10.62	12.43	12.54	3.74	
Social Studies	San Rafael-1st	Mexican	19	11.79	13.89	14.01	3.95	.10
	Sierra Vista	American	21	12.19	13.67	13.56	5.89	
Language	San Rafael-2nd	Anglo	8	12.13	9.50	9.18	3.08	.53
	Sierra Vista	American	7	7.86	10.71	11.07	4.74	
Science	San Rafael-2nd	Anglo	8	9.75	8.63	8.43	1.32	.75
	Sierra Vista	American	7	8.29	9.57	9.80	3.66	

TABLE VIII (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Social Studies	San Rafael-2nd	Anglo	8	10.63	11.63	11.28	3.24	.02
	Sierra Vista	American	7	9.57	10.71	11.11	2.76	
Language	Cubero-2nd	American	13	10.92	11.08	11.10	2.87	1.20
	Seboyeta-2nd	Indian	6	11.17	12.67	12.61	1.97	
Science	Cubero-2nd	American	13	8.62	8.23	8.16	2.42	14.03**
	Seboyeta-2nd	Indian	6	10.67	13.00	13.14	2.16	
Social Studies	Cubero-2nd	American	13	8.54	9.69	9.75	2.55	1.28
	Seboyeta-2nd	Indian	6	11.00	11.67	11.55	3.14	
Language	Cubero-2nd	Mexican	8	14.63	15.63	14.97	2.74	17.59**
	San Mateo-2nd	American	8	19.63	22.13	22.78	1.70	
Science	Cubero-2nd	Mexican	8	12.38	12.88	13.98	3.62	.83
	San Mateo-2nd	American	8	15.88	16.50	15.40	1.22	
Social Studies	Cubero-2nd	Mexican	8	12.00	14.13	15.27	1.90	8.53**
	San Mateo-2nd	American	8	16.13	19.63	18.48	3.04	
Lanugage	Cubero-2nd	Mexican	8	14.63	15.63	16.34	2.74	.09
	San Rafael-2nd	American	13	16.38	16.38	15.94	4.09	
Science	Cubero-2nd	Mexican	8	12.38	12.88	14.41	3.62	.82
	San Rafael-2nd	American	13	15.00	14.15	13.21	4.72	
Social Studies	Cubero-2nd	Mexican	8	12.00	14.13	17.40	1.90	8.42**
	San Rafael-2nd	American	13	19.00	16.08	14.06	4.86	
Language	Cubero-2nd	Mexican	8	14.63	15.63	16.13	2.74	.28
	Seboyeta	American	16	17.00	17.19	16.93	3.54	

TABLE VIII (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Science	Cubero-2nd	Mexican	8	12.38	12.88	13.87	3.62	5.36*
	Seboyeta-2nd	American	16	14.94	17.38	16.88	3.08	
Social Studies	Cubero-2nd	Mexican	8	12.00	14.13	15.19	1.90	4.14
	Seboyeta-2nd	American	16	14.38	17.81	17.28	3.68	
Language	Cubero-2nd	Mexican	8	14.63	15.63	15.34	2.74	1.69
	Sierra-Vista	American	54	14.15	16.87	16.9[illegible]	4.33	
Science	Cubero-2nd	Mexican	8	12.38	12.88	11.71	3.62	1.42
	Sierra Vista	American	54	10.56	13.00	13.17	4.16	
Social Studies	Cubero-2nd	Mexican	8	12.00	14.13	13.9	1.90	.91
	Sierra Vista	American	54	11.72	15.17	15.19	4.78	
Language	San Mateo-2nd	Mexican	8	19.63	22.13	20.72	1.69	10.22**
	San Rafael-2nd	American	13	16.38	16.38	17.25	4.09	
Science	San Mateo-2nd	Mexican	8	15.88	16.50	16.06	1.22	1.97
	San Rafael-2nd	American	13	15.00	14.15	14.43	4.72	
Social Studies	San Mateo-2nd	Mexican	8	16.13	19.63	20.96	3.04	25.33**
	San Rafael-2nd	American	13	19.00	16.08	15.26	4.86	
Language	San Mateo-2nd	Mexican	8	19.63	22.13	21.48	1.69	8.34
	Seboyeta-2nd	American	16	17.00	17.19	17.51	3.54	
Science	San Mateo-2nd	Mexican	8	15.88	16.50	16.23	1.22	1.53
	Seboyeta-2nd	American	16	14.94	17.38	17.51	3.08	
Social Studies	San Mateo-2nd	Mexican	8	16.13	19.63	18.84	3.04	.32
	Seboyeta-2nd	American	16	14.38	17.81	18.20	3.68	

TABLE VIII (continued)

Variable	School & Grade Level	Ethnic Group	n	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev.	F Ratio
Language	San Mateo-2nd	Mexican	8	19.63	22.13	18.78	1.69	1.24
	Sierra Vista	American	54	14.15	16.87	17.37	4.33	
Science	San Mateo-2nd	Mexican	8	15.88	16.50	13.31	1.22	.02
	Sierra Vista	American	54	10.56	13.00	13.47	4.16	
Social Studies	San Mateo-2nd	Mexican	8	16.13	19.63	17.02	3.04	1.13
	Sierra Vista	American	54	11.72	15.17	15.55	4.78	
Language	San Rafael-2nd	Mexican	13	16.38	16.38	16.60	4.09	.15
	Seboyeta-2nd	American	16	17.00	17.19	17.01	3.54	
Science	San Rafael-2nd	Mexican	13	15.00	14.15	14.13	4.72	9.41
	Seboyeta-2nd	American	16	14.94	17.38	17.40	3.08	
Social Studies	San Rafael-2nd	Mexican	13	19.00	16.08	14.11	4.86	26.06**
	Seboyeta-2nd	American	16	14.38	17.81	19.41	3.68	
Language	San Rafael-2nd	Mexican	13	16.38	16.38	15.03	4.09	5.57*
	Sierra Vista	American	54	14.15	16.87	17.20	4.33	
Science	San Rafael-2nd	Mexican	13	15.00	14.15	11.40	4.72	4.42
	Sierra Vista	American	54	10.56	13.00	13.66	4.16	
Social Studies	San Rafael-2nd	Mexican	13	19.00	16.08	11.88	4.86	12.41**
	Sierra Vista	American	54	11.72	15.17	16.18	4.78	
Language	Seboyeta-2nd	Mexican	16	17.00	17.19	15.70	3.54	2.97
	Sierra Vista	American	54	14.15	16.87	17.31	4.33	
Science	Seboyeta-2nd	Mexican	16	14.94	17.38	15.13	3.08	2.17
	Sierra Vista	American	54	10.56	13.00	13.67	4.16	
Social Studies	Seboyeta-2nd	Mexican	16	14.38	17.81	16.39	3.68	.65
	Sierra Vista	American	54	11.72	15.17	15.59	4.78	

Experimental Group Achievement in Reading, Arithmetic, Mechanics of English and Spelling

Experimental group achievement in reading, arithmetic, mechanics of English and spelling with English as a communication medium was observed through analysis of variance based on the California Achievement Test.

Table IX presents the statistical findings relative to the CAT variables for each of the three cultural groups in the study with relationship to each school and grade level (second grade only) in the program.

Since the majority of the children entering the first grade have had no formal instruction in reading, arithmetic, English mechanics and spelling, the CAT was used as a pre/post-test measure only among second grade children in the bilingual program. The test also is used by the school district testing service to determine the achievement of non-program children. However, a pre-/post-test service is not provided.

Achievement gains indicated by the CAT are by far the most noteworthy test results found in this study. Significant and dramatic gains are consistently found among the three cultural groups in the majority of the schools. Achievement gains, with the majority at the .01 level of confidence, are found among Mexican American experimental children in Cubero, San Mateo, San Rafael, Seboyeta, and Sierra Vista. The findings give evidence that diagnostic measures have been used advantageously in providing instructional emphases in areas where deficiencies have been noted. In general, Mexican American children in the Grants bilingual program measured at the second grade level or slightly above in reading, arithmetic processes, and English language achievement in April, 1971.

Significant achievement gains also are found among Anglo American second grade experiental children in the San Rafael and Sierra Vista schools. While a greater number of significant gains, based on probability statistics, are found among Anglo American experimental children in the Rafael School as compared to the Sierra Vista School, the percentage gains are relatively similar. The significant differences, based on probability statistics, are attributable to the difference in the standard deviations of the two experimental groups. Greater variances in standard deviations are found among the Sierra Vista experimental group children. Apart from the differences in hemogeneity patterns, it can be concluded that, in general, significant gains are found in the pre-/post-test comparisons of Anglo American experimental group children in both schools. Additionally, it is observed that Anglo American children in both schools placed at/or slightly above the second grade level in reference to the CAT, April 1, 1971, results.

The greatest gains found among second grade American Indian children in Cubero are in reading comprehension and mechanics of English. Gains of approximately 17.5 and 18.5 percent are noted in arithmetic reasoning and reading vocabulary. Instructional emphasis may be extended in arithmetic fundamentals and spelling, with percentage gains noted at 5.22 and 8.33 respectively. And in Seboyeta, the greatest gains among second grade American Indian children are in reading comprehension and spelling, based on a percentage statistical measure. Instructional emphasis is needed, especially in reading vocabulary and arithmetic fundamentals, where percentage gains of 10.16 and 12.96 are noted. Otherwise, American Indian children in the two schools placed near or at the second grade level relative to the April, 1971, CAT results.

Table X illustrates achievement in reading, arithmetic, and English by ethnic groups across the different schools. Significant gains, based on probability and percentage measures, are found among second grade Anglo American children in all of the CAT variables, except arithmetic fundamentals. However, it is noted that the pre-test grade placement reference relative to the latter variable was higher than in the majority of the comparisons. As was illustrated in Table IX, these children generally placed at/or slightly above the second grade level in terms of the April, 1971, CAT post-test results.

Table X shows significant gains (probability statistical measure) for second grade American Indian children in reading vocabulary, reading comprehension, arithmetic reasoning, and mechanics of English. In addition to the probability statistical measures, the highest percentage gains for this group are found in reading comprehension and spelling. Overall, Table X shows second grade American Indian children in the bilingual program near or at the second grade level in terms of the April, 1971, CAT post-test results.

Significant achievement gains are found among second grade Mexican American children in all of the CAT variables illustrated in Table X. All of the gains are noted at the .01 level of confidence, and the percentage gains are given between -27.28 to 232.50. Additionally, it is found that these children placed at/or slightly above the second grade level in the April, 1971, CAT post-test results.

The total CAT mean scores among the three cultural groups in the study are as follows:

Cultural Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change	Grade Level Placement
Anglo American	11	147.82	39.27	12.14**	39.24	1.7
	11	205.82	35.05			2.4
American Indian	20	146.45	39.32	7.00**	23.76	1.7
	20	181.25	41.67			2.0
Mexican American	70	132.34	35.07	90.86**	43.31	1.5
	70	189.66	35.56			2.1

In reference to the foregoing illustration, it is found that the pre-test means of second grade Mexican American children was 18-19 points below that of Anglo American and American Indian second grade children. In the post-test comparison, the main difference is noted at 16 points below that of Anglo American children and 7 points above that of American Indian children. It is, therefore, recommended that a similar statistical comparison be undertaken in the 1971-72 evaluation study to ascertain rate of achievement between the three cultural groups, comparative increase or decrease in achievement gains between the three cultural groups (achievement gaps, based on pre/post-test results and on a longitudinal analysis), and achievement gains based on experimental versus control group comparative analyses.

The data in Table XI illustrate second grade experimental group achievement (cultural groups combined) in the various project schools, with reference to the given CAT variables. Table XI identifies CAT variables requiring attention in particular schools in the project, and Table IX illustrates particular CAT variables requiring attention among the three cultural groups in the project. In Cubero, for example, special attention may be given to arithmetic fundamentals and spelling among second grade American Indian and Mexican American children. In Seboyeta, program emphasis in reading vocabulary and reading comprehension may be extended to enhance the rate of development among Mexican American and American Indian children. Additionally, while significant gains are noted in mechanics of English among second grade Mexican American children in the San Rafael school, the post-test mean shows this group of children below grade level (grade 1.4). Special instructional emphasis may be extended in this particular area. And while dramatic gains are found among second grade Mexican American children in the Sierra Vista School, continuous attention may be given in the areas of reading comprehension and arithmetic processes.

The foregoing observations are presented not as a critique of the present instructional/curricular programs in reading, arithmetic, and English, but rather to reveal academically deficient areas among the experimental groups, and to encourage administrators and teachers to apply continuous or increased instructional/curricular emphases that serve to enhance the learning scheme.

Experimental group differences (relative to the CAT variables) between the different schools, with each ethnic group held constant, are given in the statistical findings illustrated in Table XI. It is noted that no significant differences (.05 level of confidence) are found among Anglo American second graders in comparing the San Rafael and Sierra Vista experimental post-test means. And except in spelling, no significant differences (.05 level of confidence) are found among American Indian second graders in comparing the Cubero and Seboyeta experimental post-test means. In reference to the difference in spelling achievement, higher pre-test and post-test means are found among the Seboyeta experimental children as compared to the Cubero experimental group. Otherwise, relatively small and insignificant variances appear in relationship to all of the other post-test means between the two experimental groups.

The following significant differences are found between Mexican American second grade experimental group children in the six schools:

Variable	School	N	Adjusted Post-Test Means	F Ratio	Post-Test Grade Level Placement
Read. Compreh.	Cubero	6	8.54	4.92*	1.9
	San Mateo	8	11.72		2.4
Arth. Fund	Cubero	6	38.40	5.31*	2.3
	San Mateo	8	42.57		3.0
Arth. Fund.	Cubero	6	38.28	7.71*	2.2
	San Rafael	13	42.56		3.0
Spelling	Cubero	6	6.13	4.39*	2.0
	San Rafael	13	9.40		2.6

Variable	School	N	Adjusted Post-Test Means	F Ratio	Post-Test Grade Level Placement
Read. Voc.	Cubero	6	62.55	4.74*	2.2
	Seboyeta	9	54.97		1.9
Read. Voc.	San Mateo	8	59.87	6.70*	2.3
	San Rafael	13	65.47		2.3
Read. Voc.	San Mateo	8	62.02	6.72*	2.3
	Seboyeta	9	56.65		1.9
Read. Compreh.	San Mateo	8	11.49	9.13**	2.4
	Seboyeta	9	6.45		1.7
Spelling	San Mateo	8	5.31	6.19*	2.1
	Sierra Vista	34	8.22		2.2
Read. Voc.	San Rafael	13	65.54	38.93**	2.3
	Seboyeta	9	53.33		1.9
Read. Compreh.	San Rafeal	13	9.62	4.62*	2.0
	Seboyeta	9	5.89		1.7
Spelling	San Rafeal	13	9.18	4.47*	2.5
		9	6.19		1.9
Read. Voc.	Seboyeta	9	50.05	9.55**	1.9
	Sierra Vista	34	59.72		2.0

Again, the findings are presented not as a critique of individual school programs, but as relevant information for administrators and teacher relative to areas of academic deficiencies among the children. Thus, the comparative analyses between schools simply serve as reference points rather than methodological comparisons.

Although a control group was not used in the study, the grade placement and gain measures should provide sufficient evidence relative to the English language component of the bilingual program.

Based on the existing data, it is not possible to ascertain differences in achievement gains between program and non-program children. However, it can be concluded that the dual language medium in the bilingual program has not been detrimental to academic achievement among the children in the program.

TABLE IX - EXPERIMENTAL GROUP ACHIEVEMENT IN READING ARITHMETIC, AND ENGLISH BY ETHNIC GROUP, GRADE LEVEL AND SCHOOL, BASED ON THE CALIFORNIA ACHIEVEMENT TEST.

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Cubero 2nd	Mex. Am	6	46.83	14.21	3.70	30.25	1.5
			6	61.00	8.31			2.2
Reading Comprehension			6	4.17	1.07	12.70**	104.00	1.5
			6	8.50	2.50			1.9
Total Reading			6	51.00	14.55	5.58*	36.27	1.7
			6	69.50	9.74			2.1
Arith. Reasoning			6	30.17	3.58	8.45	22.10	1.8
			6	36.83	3.67			2.3
Arith Fundamentals			6	37.83	3.44	.06	1.76	2.1
			6	38.50	4.72			2.3
Total Arithmetic			6	68.00	5.69	2.86	10.78	2.0
			6	75.33	7.85			2.3
Mech. of English			6	27.50	5.97	12.41**	66.67	1.6
			6	45.83	9.99			2.3
Spelling			6	2.17	1.67	4.12	169.23	1.4
			6	5.83	3.67			2.0
Total Language			6	29.67	6.92	11.19**	74.16	1.5
			6	51.67	12.97			2.3
Total Battery			6	148.67	23.05	8.74*	32.17	1.7
			6	196.50	27.89			2.3

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	San Mateo 2nd	Mex. Am	8	52.12	5.44	14.55**	20.38	1.7
			8	62.75	4.97			2.3
Reading Comprehension			8	4.50	1.32	55.01**	161.11	1.5
			8	11.75	2.22			2.4
Total Reading			8	56.50	6.08	28.89**	31.86	1.7
			8	74.50	6.44			2.4
Arith Reasoning			8	34.50	3.46	5.98*	10.87	2.1
			8	38.25	2.11			2.5
Arith Fundamentals			8	37.38	1.58	67.24**	13.71	2.1
			8	42.50	.50			3.0
Total Arithmetic			8	71.88	4.01	27.85**	12.35	2.1
			8	80.75	1.92			2.7
Mech. of English			8	32.88	3.62	25.11**	36.12	1.7
			8	44.75	5.12			2.3
Spelling			8	3.38	1.80	10.74**	100.00	1.5
			8	6.75	2.05			2.1
Total Language			8	36.25	5.14	30.32**	42.07	1.7
			8	51.50	5.22			2.3
Total Battery			8	164.75	12.65	46.03**	27.01	1.8
			8	209.25	11.88			2.5

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	San Rafael 2nd	Mex. Am	13	45.38	5.66	62.10**	40.34	1.5
			13	63.69	5.72			2.3
Reading Comprehension			13	2.92	2.13	31.31**	221.05	1.3
			13	9.38	3.39			2.0
Total Reading			13	48.31	6.92	63.56**	51.27	1.5
			13	73.08	8.24			2.3
Arithmetic Reasoning			13	21.85	6.87	21.72**	48.94	1.4
			13	32.54	3.99			1.9
Arithmetic Fundamentals			13	36.62	3.61	26.09**	15.97	1.9
			13	42.46	1.65			2.9
Total Arithmetic			13	58.46	8.71	31.86**	28.29	1.6
			13	75.00	5.20			2.3
Mechanics of English			13	30.08	4.84	17.09**	34.53	1.2
			13	40.46	7.23			1.4
Spelling			13	2.38	1.27	32.41**	300.00	1.4
			13	9.54	4.16			2.6
Total Language			13	32.46	5.21	32.09**	54.03	1.6
			13	50.00	9.37			2.2
Total Battery			13	139.23	17.04	58.15**	42.26	1.6
			13	198.08	20.59			2.3

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Seboyeta 2nd	Mex Am.	9	50.55	12.94	.73	10.77	1.7
			9	56.00	12.49			1.9
Reading Comprehension			9	3.89	3.54	1.23	60.00	1.4
			9	6.22	4.78			1.7
Total Reading			9	54.44	15.70	.97	14.29	1.6
			9	62.22	15.84			1.9
Arithmetic Reasoning			9	22.67	8.47	8.60**	47.55	1.5
			9	33.44	6.02			2.0
Arithmetic Fundamentals			9	32.67	8.25	8.01*	25.85	1.7
			9	41.11	1.79			2.7
Total Arithmetic			9	55.22	16.23	9.73**	35.01	1.6
			9	74.56	6.62			2.3
Mechanics of English			9	28.00	9.03	4.50*	41.27	1.6
			9	39.56	12.47			2.0
Spelling			9	1.89	2.42	3.96	200.00	1.3
			9	5.67	4.78			2.0
Total Language			9	29.89	11.14	5.09*	51.30	1.5
			9	45.22	15.65			2.0
Total Battery			9	140.67	40.95	4.49*	29.38	1.6
			9	182.00	36.90			2.0

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Sierra Vista 2nd	Mex. Am	34	39.26	12.36	43.42**	48.09	1.3
			34	58.15	10.88			2.0
Reading Comprehension			34	2.32	2.17	34.15**	210.13	1.3
			34	7.21	4.28			1.8
Total Reading			34	41.59	13.61	49.06**	57.14	1.3
			34	65.35	13.95			1.9
Arithmetic Reasoning			34	20.68	5.63	53.81**	53.77	1.4
			34	31.79	6.64			1.9
Arithmetic Fundamentals			34	25.38	12.58	19.56**	45.42	1.4
			34	36.91	8.13			2.0
Total Arithmetic			34	47.21	17.75	30.38**	45.55	1.4
			34	68.71	13.68			1.9
Mechanics of English			34	26.38	7.21	24.04**	50.17	1.5
			34	39.62	13.73			2.0
Spelling			34	2.12	1.92	51.85	272.22	1.4
			34	7.88	4.18			2.2
Total Language			34	28.50	8.71	33.17	66.67	1.5
			34	47.50	16.83			2.1
Total Battery			34	117.00	35.78	47.40	56.11	1.4
			34	182.65	41.47			2.0

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	San Rafael 2nd	Anglo Am	5	48.80	3.06	19.87**	34.43	1.6
			5	65.60	6.89			2.5
Reading Comprehension			5	2.80	2.32	19.01**	278.57	1.3
			5	10.60	2.73			2.2
Total Reading			5	51.60	4.50	10.86**	43.80	1.6
			5	74.20	12.95			2.4
Arithmetic Reasoning			5	26.40	3.88	.63	20.45	1.6
			5	31.80	12.95			1.9
Arithmetic Fundamentals			5	39.80	1.72	23.50**	11.56	2.4
			5	44.40	.80			3.4
Total Arithmetic			5	66.20	5.15	21.73**	24.17	1.9
			5	82.20	4.53			2.9
Mechanics of English			5	38.40	10.19	2.40	27.60	2.0
			5	49.00	9.10			2.6
Spelling			5	3.40	.49	36.50**	217.65	1.5
			5	10.80	2.40			2.8
Total Language			5	41.80	10.53	8.12*	43.06	1.9
			5	59.80	6.97			2.6
Total Battery			5	159.60	18.77	15.49**	35.46	1.8
			5	216.20	21.79			2.6

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Sierra Vista 2nd	Anglo Am	5	43.60	12.91	4.22	38.53	1.4
			5	60.40	10.03			2.1
Reading Comprehension			5	4.40	5.28	1.98	104.55	1.5
			5	9.00	3.85			2.0
Total Reading			5	48.00	17.67	3.67	44.58	1.5
			5	69.40	13.63			2.1
Arithmetic Reading			5	20.40	12.08	4.19	67.65	1.4
			5	34.20	5.98			2.1
Arithmetic Fundamentals			5	28.40	12.09	1.13	27.46	1.5
			5	36.20	8.30			2.0
Total Aritimetic			5	48.80	22.94	1.86	39.75	1.4
			5	68.20	16.77			2.0
Mechanics of English			5	34.20	10.70	1.41	28.65	1.8
			5	44.00	12.54			2.3
Spelling			5	2.40	2.58	5.88*	250.00	1.4
			5	8.40	4.22			2.3
Total Language			5	36.60	13.12	2.32	43.17	1.7
			5	52.40	16.04			2.3
Total Battery			5	133.40	51.57	2.92	42.43	1.5
			5	190.00	41.49			2.2

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Cubero 2nd	Am Ind	10	45.30	14.40	1.58	18.54	1.5
			10	53.70	13.91			1.8
Reading Comprehension			10	4.00	2.41	4.89*	85.00	1.5
			10	7.40	3.93			1.8
Total Reading			10	49.30	16.12	2.26	23.94	1.5
			10	61.10	17.11			1.8
Arithmetic Reasoning			10	26.10	6.88	1.28	17.62	1.6
			10	30.70	10.02			1.8
Arithmetic Fundamentals			10	35.50	11.29	.11	5.22	1.9
			10	36.30	11.46			2.0
Total Arithmetic			10	60.60	16.98	.52	10.56	1.7
			10	67.00	20.50			1.9
Mechanics of English			10	25.80	7.30	5.88*	51.55	1.5
			10	39.10	14.73			2.0
Spelling			10	2.40	1.91	.03	8.33	1.4
			10	2.60	2.80			1.4
Total Language			10	28.20	8.99	5.12*	47.87	1.5
			10	41.70	15.47			1.9
Total Battery			10	138.10	39.80	2.28	22.88	1.6
			10	169.70	48.54			1.9

TABLE IX - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/Post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Seboyeta 2nd	Amer Ind	6	50.83	13.97	.39	10.16	1.7
			6	56.00	11.79			1.9
Reading Comprehension			6	5.50	4.11	.72	39.39	1.6
			6	7.67	3.94			1.8
Total Reading			6	56.33	17.25	.51	13.02	1.7
			6	63.67	15.03			1.9
Arithmetic Reasoning			6	30.50	6.08	4.62	22.40	1.8
			6	37.33	3.68			2.4
Arithmetic Fundamentals			6	36.00	5.07	3.60	12.96	2.0
			6	40.67	2.13			2.6
Total Arithmetic			6	66.50	10.14	4.85	17.29	1.9
			6	78.00	5.77			2.5
Mechanics of English			6	33.00	7.81	3.02	24.75	1.8
			6	41.17	7.01			2.1
Spelling			6	4.67	5.91	.87	75.00	1.8
			6	8.17	5.90			2.4
Total Language			6	37.67	13.67	2.11	30.97	1.8
			6	49.33	11.60			2.2
Total Battery			6	160.50	36.90	2.06	19.00	1.8
			6	191.00	29.90			2.2

TABLE X - EXPERIMENTAL GROUP ACHIEVEMENT IN READING, ARITHMETIC, AND ENGLISH BY SCHOOL AND GRADE LEVEL (ETHNIC GROUPS COMBINED) BASED ON THE CALIFORNIA ACHIEVEMENT TEST

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	All - 2nd	Anglo	11	46.45	9.32	17.96**	36.99	1.5
		Amer.	11	63.64	8.80			2.3
Reading Comprehension			11	3.82	4.02	13.76**	159.52	1.4
			11	9.91	3.29			2.0
Total Reasoning			11	50.27	12.51	15.18**	44.48	1.5
			11	72.64	13.15			2.3
Arithmetic Reasoning			11	24.18	9.35	4.75*	38.72	1.5
			11	33.54	9.84			2.0
Arithmetic Fundamentals			11	34.55	9.97	2.58	17.89	1.8
			11	40.73	6.98			2.6
Total Arithmetic			11	58.73	18.31	5.70*	29.41	1.6
			11	76.00	13.72			2.4
Mechanics of English			11	35.82	10.28	5.90*	32.49	1.9
			11	47.45	11.13			2.4
Spelling			11	3.00	1.86	28.91**	224.24	1.5
			11	9.73	3.49			2.6
Total Language			11	38.82	11.68	11.25**	47.31	1.8
			11	57.18	12.78			2.5
Total Battery			11	147.82	39.27	12.14**	39.24	1.7
			11	205.82	35.05			2.4

TABLE X - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	All - 2nd	American Indian	20	45.50	16.50	4.97*	23.30	1.5
			20	56.10	12.51			1.9
Reading Comprehension			20	4.40	3.01	9.99**	81.82	1.5
			20	8.00	3.95			1.9
Total Reasoning			20	52.40	16.84	4.88*	22.33	1.6
			20	64.10	15.77			1.9
Arithmetic			20	26.50	6.81	7.03*	24.34	1.6
			20	32.95	8.13			1.9
Arithmetic			20	35.35	9.14	.89	7.64	1.9
			20	38.05	8.42			2.2
Total Arithmetic			20	61.85	14.39	3.49	14.79	1.7
			20	71.00	15.74			2.1
Mechanics of English			20	28.90	8.62	11.68**	41.70	1.6
			20	40.95	12.71			2.1
Spelling			20	3.30	3.82	2.35	68.18	1.5
			20	5.55	5.12			2.0
Total Language			20	32.20	12.02	9.98**	43.48	1.6
			20	46.20	15.12			2.1
Total Battery			20	146.45	39.32	7.99*	23.76	1.7
			20	181.25	41.67			2.0

TABLE X - Continued

Variable	School & Grade Level	Group	N	Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	All - 2nd	Mexican	70	43.97	12.14	68.93**	35.71	1.4
		American	70	59.67	9.97			2.1
Reading Comprehension			70	3.04	2.39	75.56**	166.67	1.4
			70	8.11	4.21			1.9
Total Reasoning			70	47.00	13.65	83.73**	44.22	1.5
			70	67.79	13.03			2.0
Arithmetic Reasoning			70	23.54	7.61	70.27**	41.50	1.5
			70	33.31	5.98			2.0
Total Fundamentals			70	30.84	10.93	30.40**	27.28	1.6
			70	39.26	6.42			2.4
Total Arithmetic			70	54.93	16.86	52.55**	32.12	1.5
			70	72.57	11.15			2.1
Mechanics of English			70	28.11	7.03	60.16**	45.43	1.6
			70	40.89	11.73			2.1
Spelling			70	2.29	1.91	90.75**	232.50	1.4
			70	7.60	4.22			2.2
Total Language			70	30.40	8.64	81.01**	59.49	1.6
			70	48.49	14.39			2.1
Total Battery			70	132.34	35.07	90.86**	43.31	1.5
			70	189.66	35.56			2.1

TABLE XI – EXPERIMENTAL GROUP ACHIEVEMENT IN READING, ARITHMETIC, AND ENGLISH BY ETHNIC GROUP AND GRADE LEVEL (ALL SCHOOLS COMBINED), BASED ON THE CALIFORNIA ACHIEVEMENT TEST

Variable	School & Grade Level	Ethnic Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Cubero 2nd	All	17	46.06	13.94	5.63*	24.27	1.5
			17	57.24	12.66			2.0
Reading Comprehension			17	4.18	2.01	14.48**	91.55	1.5
			17	8.00	3.48			1.9
Total Reading			17	50.24	15.16	7.71**	29.86	1.5
			17	65.24	15.39			2.0
Arithmetic Reasoning			17	27.88	6.09	4.30*	19.62	1.7
			17	33.35	8.61			2.0
Arithmetic Fundamentals			17	35.94	9.06	.25	4.58	1.9
			17	37.59	9.47			2.1
Total Arithmetic			17	63.82	14.01	1.64	11.15	1.8
			17	70.94	17.17			2.0
Mechanics of English			17	26.71	6.76	17.28**	59.25	1.5
			17	42.53	13.64			2.2
Spelling			17	2.41	1.82	2.98	75.61	1.4
			17	4.24	3.81			1.7
Total Language			17	29.12	8.19	15.70**	60.61	1.5
			17	46.76	15.82			2.1
Total Battery			17	143.18	34.11	8.03**	27.73	1.6
			17	182.88	44.45			2.0

TABLE XI - Continued

Variable	School & Grade Level	Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	San Mateo 2nd	All	8	52.13	5.44	14.55**	20.38	1.7
			8	62.75	4.97			2.3
Reading Comprehension			8	4.50	1.32	55.01**	161.11	1.5
			8	11.75	2.22			2.4
Total Reading			8	56.50	6.08	28.89**	31.86	1.7
			8	74.50	6.44			2.4
Arithmetic Reasoning			8	34.50	3.46	5.98*	10.87	2.1
			8	38.25	2.11			2.5
Arithmetic Fundamentals			8	37.38	1.58	67.24**	13.71	2.1
			8	42.50	.50			3.0
Total Arithmetic			8	71.88	4.01	27.85**	12.35	2.1
			8	80.75	1.92			2.7
Mechanics of English			8	32.88	3.62	25.11**	36.12	1.7
			8	44.75	5.12			2.3
Spelling			8	3.38	1.80	10.74	100.00	1.5
			8	6.75	2.05			2.1
Total Language			8	36.25	5.14	30.32	42.07	1.7
			8	51.50	5.22			2.3
Total Battery			8	164.75	12.65	46.03**	27.01	1.8
			8	209.25	11.88			2.5

TABLE XI - Continued

Variable	School & Grade Level	Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	San Rafael 2nd	All	18	46.33	5.30	82.90**	38.61	1.5
			18	64.22	6.12			2.4
Reading Comprehension			18	2.89	2.18	51.51**	236.54	1.3
			18	9.72	3.26			2.0
Total Reading			18	49.22	6.51	71.78**	49.10	1.5
			18	73.39	9.79			2.3
Arithmetic Reasoning			18	23.11	6.51	14.36**	39.90	1.5
			18	32.33	7.63			1.9
Arithmetic Fundamentals			18	37.50	3.50	33.96**	14.66	2.1
			18	43.00	1.70			3.1
Total Arithmetic			18	60.61	8.62	41.54**	27.04	1.7
			18	77.00	5.97			2.4
Mechanics of English			18	32.39	7.73	13.73**	32.25	1.7
			18	42.83	8.68			2.2
Spelling			18	2.67	1.20	55.85**	270.83	1.4
			18	9.89	3.80			2.6
Total Language			18	35.06	8.24	32.32**	50.40	1.7
			18	52.72	9.81			2.3
Total Battery			18	144.89	19.77	64.38**	40.18	1.6
			18	203.11	22.45			2.4

TABLE XI - Continued

Variable	School & Grade Level	Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Seboyeta 2nd	All	15	50.67	13.36	1.21	10.53	1.7
			15	56.00	12.21			1.9
Reading Comprehension			15	4.53	3.86	2.03	50.00	1.5
			15	6.80	4.52			1.7
Total Reading			15	55.20	16.36	1.58	13.77	1.7
			15	62.80	15.54			1.9
Arithmetic Reasoning			15	25.80	8.52	11.46**	35.66	1.6
			15	35.00	5.55			2.2
Arithmetic Fundamentals			15	34.00	7.33	11.69**	20.39	1.8
			15	40.93	1.95			2.6
Total Arithmetic			15	59.73	15.15	13.50**	27.12	1.7
			15	75.93	6.52			2.3
Mechanics of English			15	30.00	8.91	7.54*	34.00	1.7
			15	40.20	10.66			2.1
Spelling			15	3.00	4.40	3.88*	122.22	1.5
			15	6.67	5.40			2.1
Total Language			15	33.00	12.80	7.30*	42.02	1.6
			15	46.87	14.31			2.1
Total Battery			15	148.60	40.56	6.75*	24.90	1.7
			15	185.60	34.55			2.1

TABLE XI - Continued

Variable	School & Grade Level	Group	N	Pre/post Test Means	St'd Dev.	F Ratio	% Change	Grade Level Placement
Reading Vocabulary	Sierra Vista 2nd	All	43	39.65	13.57	52.20**	48.27	1.3
			43	58.79	10.51			2.0
Reading Comprehension			43	2.70	2.78	40.20**	184.48	1.3
			43	7.67	4.26			1.8
Total Reading			43	43.51	14.97	53.66**	52.75	1.4
			43	66.47	13.72			2.0
Arithmetic Reasoning			43	20.72	6.55	64.62**	54.88	1.4
			43	32.09	6.42			1.9
Arithmetic Fundamentals			43	26.77	12.57	20.01**	38.14	1.4
			43	36.98	7.79			2.0
Total Arithmetic			43	48.40	18.17	34.10**	42.19	1.4
			43	68.81	13.54			2.0
Mechanics of English			43	27.67	8.38	27.51**	46.89	1.6
			43	40.65	13.67			2.1
Spelling			43	2.28	2.12	63.73**	253.06	1.4
			43	8.05	4.18			2.4
Total Language			43	29.95	10.13	38.02**	62.11	1.5
			43	48.56	16.73			2.1
Total Battery			43	121.63	39.09	52.58**	51.85	1.4
			43	184.70	40.61			2.1

TABLE XII - EXPERIMENTAL GROUP DIFFERENCES IN READING, ARITHMETIC, AND ENGLISH, BASED ON THE CALIFORNIA ACHIEVEMENT TEST AND ANALYSIS OF CONVARIANCE

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	San Rafael 2nd	Anglo	5	48.80	65.60	64.35	6.89	.22	2.5
	Sierra Vista 2nd	Amer.	5	43.60	60.40	61.65	10.03		2.1
Reading Comprehension	San Rafael 2nd	Anglo	5	2.80	10.60	11.01	2.73	1.48	2.2
	Sierra Vista 2nd	Amer.	5	4.40	9.00	8.59	3.85		2.0
Total Reading	San Rafael 2nd	Anglo	5	51.60	74.20	73.26	12.95	.11	2.4
	Sierra Vista 2nd	Amer.	5	48.00	69.40	70.34	13.63		2.1
Arithmetic Reasoning	San Rafael 2nd	Anglo	5	26.40	31.80	30.30	12.95	.56	1.9
	Sierra Vista 2nd	Amer.	5	20.40	34.20	35.70	5.98		2.1
Arithmetic Fundamentals	San Rafael 2nd	Anglo	5	39.80	44.40	41.97	.80	.64	3.4
	Sierra Vista 2nd	Amer.	5	28.40	36.20	38.63	8.30		2.0
Total Arithmetic	San Rafael 2nd	Anglo	5	66.20	82.20	77.25	4.53	.38	2.9
	Sierra Vista 2nd	Amer.	5	48.80	68.20	73.15	16.77		2.0
Mechanics of English	San Rafael 2nd	Anglo	5	38.40	49.00	47.33	9.09	.09	2.6
	Sierra Vista 2nd	Amer.	5	34.20	44.00	45.68	12.54		2.3
Spelling	San Rafael 2nd	Anglo	5	3.40	10.80	10.09	2.40	.32	2.8
	Sierra Vista 2nd	Amer.	5	2.40	8.40	9.11	4.22		2.3
Total Language	San Rafael 2nd	Anglo	5	41.80	59.80	57.63	6.97	.29	2.6
	Sierra Vista 2nd	Amer.	5	36.60	52.40	54.57	16.04		2.3
Total Battery	San Rafael 2nd	Anglo	5	159.60	216.20	206.79	21.79	.	2.6
	Sierra Vista 2nd	Amer.	5	133.40	190.00	199.41	41.49		2.2

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	Cubero 2nd	Amer.	10	45.30	53.70	55.48	13.91	.71	1.8
	Seboyeta 2nd	Indian	6	50.83	56.00	53.04	11.79		1.9
Reading Comprehension	Cubero 2nd	Amer.	10	4.00	7.40	7.85	3.93	.27	1.8
	Seboyeta 2nd	Indian	6	5.50	7.67	6.92	3.94		1.8
Total Reading	Cubero 2nd	Amer.	10	49.30	61.10	63.53	17.11	1.24	1.8
	Seboyeta 2nd	Indian	6	56.33	63.67	59.62	15.03		1.9
Arithmetic Reasoning	Cubero 2nd	Amer.	10	26.10	30.70	32.16	10.02	.61	1.8
	Seboyeta 2nd	Indian	6	30.50	37.33	34.90	3.68		2.4
Arithmetic Fundamentals	Cubero 2nd	Amer.	10	34.50	36.30	36.79	11.46	1.83	2.0
	Seboyeta 2nd	Indian	6	36.00	40.67	39.85	2.13		2.6
Total Arithmetic	Cubero 2nd	Amer.	10	60.60	67.00	69.16	20.50	1.22	1.9
	Seboyeta 2nd	Indian	6	66.50	78.00	74.40	5.77		2.5
Mechanics of English	Cubero 2nd	Amer.	10	25.80	39.10	42.05	14.73	.97	2.0
	Seboyeta 2nd	Indian	6	33.00	41.17	36.25	7.01		2.1
Spelling	Cubero 2nd	Amer.	10	2.40	2.60	3.35	2.80	6.00*	1.4
	Seboyeta 2nd	Indian	6	4.67	8.17	6.92	5.90		2.3
Total Language	Cubero 2nd	Amer.	10	28.20	41.70	45.07	15.47	.05	1.9
	Seboyeta 2nd	Indian	6	37.67	49.33	43.71	11.60		2.2
Total Battery	Cubero 2nd	Amer.	10	138.10	169.70	178.32	48.54	.03	1.9
	Seboyeta 2nd	Indian	6	160.50	191.00	176.64	29.90		2.2

TABLE XII - Continued

Variable	School & Grade Level		Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	Cubero	2nd	Mex-Am	6	46.83	61.00	62.36	8.31	.05	2.2
	San Mateo	2nd		8	52.13	62.75	61.73	4.97		2.3
Reading Comprehension	Cubero	2nd	Mex-Am	6	4.17	8.50	8.54	2.50	4.92	1.9
	San Mateo	2nd		8	4.50	11.75	11.72	2.22		2.4
Total Reading	Cubero	2nd	Mex-Am	6	51.00	69.50	71.06	9.74	.35	2.1
	San Mateo	2nd		8	56.50	74.50	73.33	6.44		2.4
Arithmetic Reasoning	Cubero	2nd	Mex-Am	6	30.17	36.83	37.65	3.67	.00	2.2
	San Mateo	2nd		8	34.50	38.25	37.64	2.11		2.5
Arithmetic Fundamentals	Cubero	2nd	Mex-Am	6	37.83	38.50	38.40	4.72	5.31*	2.3
	San Mateo	2nd		8	37.38	42.50	42.57	.50		3.0
Total Arithmetic	Cubero	2nd	Mex-Am	6	68.00	75.33	77.11	7.85	.91	2.3
	San Mateo	2nd		8	71.88	80.75	79.41	1.92		2.7
Mechanics of English	Cubero	2nd	Mex-Am	6	27.50	45.83	48.43	9.99	1.57	2.3
	San Mateo	2nd		8	32.88	44.75	42.80	5.12		2.3
Spelling	Cubero	2nd	Mex-Am	6	2.17	5.83	6.53	3.67	.04	2.0
	San Mateo	2nd		8	3.38	6.75	6.23	2.05		2.1
Total Language	Cubero	2nd	Mex-Am	6	29.67	51.67	54.97	12.97	1.22	2.3
	San Mateo	2nd		8	36.25	51.50	49.02	5.22		2.3
Total Battery	Cubero	2nd	Mex-Am	6	148.67	196.50	204.61	27.89	.03	2.3
	San Mateo	2nd		8	164.75	209.25	203.17	11.88		2.5

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	Cubero 2nd	Mex-Am	6	46.83	61.00	60.51	8.31	1.70	2.2
	San Rafael 2nd		13	45.38	63.69	63.92	5.72		2.3
Reading Comprehension	Cubero 2nd	Mex-Am	6	4.17	8.50	8.46	2.50	.28	1.9
	San Rafael 2nd		13	2.92	9.38	9.40	3.39		2.0
Total Reading	Cubero 2nd	Mex-Am	6	51.00	69.50	68.56	9.74	1.66	2.1
	San Rafael 2nd		13	48.31	73.08	73.51	8.24		2.3
Arithmetic Reasoning	Cubero 2nd	Mex-Am	6	30.17	36.83	34.67	3.67	.32	2.3
	San Rafael 2nd		13	21.85	32.54	33.54	3.99		1.9
Arithmetic Fundamentals	Cubero 2nd	Mex-Am	6	37.83	38.50	38.28	4.72	7.71*	2.2
	San Rafael 2nd		13	36.62	42.46	42.56	1.65		3.0
Total Arithmetic	Cubero 2nd	Mex-Am	6	68.00	75.33	72.28	7.85	1.83	2.0
	San Rafael 2nd		13	58.46	75.00	76.41	5.20		2.3
Mechanics of English	Cubero 2nd	Mex-Am	6	27.50	45.83	47.14	9.99	3.32	2.3
	San Rafael 2nd		13	30.08	40.46	39.86	7.23		2.1
Spelling	Cubero 2nd	Mex-Am	6	2.17	5.83	6.13	3.67	4.39*	2.0
	San Rafael 2nd		13	2.38	9.54	9.40	4.16		2.6
Total Language	Cubero 2nd	Mex-Am	6	29.67	51.67	53.27	12.97	.59	2.3
	San Rafael 2nd		13	32.46	50.00	49.26	9.37		2.2
Total Battery	Cubero 2nd	Mex-Am	6	148.67	196.50	191.26	27.89	.95	2.3
	San Rafael 2nd		13	139.23	198.08	200.49	20.59		2.3

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	Cubero 2nd	Mex-Am	6	46.83	61.00	62.55	8.31	4.74*	2.2
	Seboyeta 2nd		9	50.56	56.00	54.97	12.49		1.9
Reading Comprehension	Cubero 2nd	Mex-Am	6	4.17	8.50	8.36	2.50	1.12	1.9
	Seboyeta 2nd		9	3.89	6.22	6.31	4.78		1.7
Total Reading	Cubero 2nd	Mex-Am	6	51.00	69.50	71.09	9.74	5.55*	2.1
	Seboyeta 2nd		9	54.44	62.22	61.16	15.84		1.9
Arithmetic Reasoning	Cubero 2nd	Mex-Am	6	30.17	36.83	34.48	3.67	.04	2.3
	Seboyeta 2nd		9	22.67	33.44	35.01	6.02		2.0
Arithmetic Fundamentals	Cubero 2nd	Mex-Am	6	37.83	38.50	38.08	4.72	2.76	2.3
	Seboyeta 2nd		9	32.67	41.11	41.39	1.79		2.7
Total Arithmetic	Cubero 2nd	Mex-Am	6	68.00	75.33	72.16	7.85	2.19	2.3
	Seboyeta 2nd		9	55.22	74.56	76.67	6.62		2.3
Mechanics of English	Cubero 2nd	Mex-Am	6	27.50	45.83	46.17	9.99	2.44	2.3
	Seboyeta 2nd		9	28.00	39.56	39.33	12.47		2.0
Spelling	Cubero 2nd	Mex-Am	6	2.17	5.83	5.53	3.67	.11	2.0
	Seboyeta 2nd		9	1.89	5.67	5.87	4.78		2.0
Total Language	Cubero 2nd	Mex-Am	6	29.67	51.67	51.84	12.97	2.14	2.3
	Seboyeta 2nd		9	29.89	45.22	45.11	15.65		2.0
Total Battery	Cubero 2nd	Mex-Am	6	148.67	196.50	192.15	27.89	1.18	2.3
	Seboyeta 2nd		9	140.67	182.00	184.90	36.90		2.0

TABLE XII - Continued

Variable	School & Grade Level		Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	Cubero	2nd	Mex-Am	6	46.83	61.00	57.40	8.31	.14	2.2
	Sierra Vista	2nd		34	39.26	58.15	58.78	10.88		2.0
Reading Comprehension	Cubero	2nd	Mex-Am	6	4.17	8.50	7.08	2.50	.04	1.9
	Sierra Vista	2nd		34	2.32	7.21	7.46	4.28		1.5
Total Reading	Cubero	2nd	Mex-Am	6	51.00	69.50	63.87	9.74	.32	2.1
	Sierra Vista	2nd		34	41.59	65.35	66.35	13.95		2.0
Arithmetic Reasoning	Cubero	2nd	Mex-Am	6	30.17	36.83	29.78	3.67	2.06	2.3
	Sierra Vista	2nd		34	20.68	31.79	33.04	6.64		1.9
Arithmetic Fundamentals	Cubero	2nd	Mex-Am	6	37.83	38.50	33.79	4.72	1.98	2.3
	Sierra Vista	2nd		34	25.38	36.91	37.74	8.13		2.0
Total Arithmetic	Cubero	2nd	Mex-Am	6	68.00	75.33	64.02	7.846	3.11	2.3
	Sierra Vista	2nd		34	47.21	68.71	70.70	13.68		2.0
Mechanics of English	Cubero	2nd	Mex-Am	6	27.50	45.83	44.74	9.99	1.04	2.3
	Sierra Vista	2nd		34	26.38	39.62	39.81	13.73		2.0
Spelling	Cubero	2nd	Mex-Am	6	2.17	5.83	5.76	3.67	3.33	2.0
	Sierra Vista	2nd		34	2.12	7.88	7.89	4.18		2.2
Total Language	Cubero	2nd	Mex-Am	6	29.67	51.67	50.32	12.97	.23	2.3
	Sierra Vista	2nd		34	28.50	47.50	47.74	16.83		2.1
Total Battery	Cubero	2nd	Mex-Am	6	148.67	196.50	169.65	27.89	3.21	2.3
	Sierra Vista	2nd		34	117.00	182.65	187.39	41.47		2.0

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	San Mateo 2nd	Mex-Am	8	52.13	62.75	59.87	4.97	6.70*	2.3
	San Rafael 2nd		13	45.38	63.69	65.47	5.72		2.3
Reading Comprehension	San Mateo 2nd	Mex-Am	8	4.50	11.75	11.66	2.22	2.01	2.4
	San Rafael 2nd		13	2.92	9.38	9.44	3.39		2.0
Total Reading	San Mateo 2nd	Mex-Am	8	56.50	74.50	71.08	6.44	1.37	2.4
	San Rafael 2nd		13	48.31	73.08	75.18	8.24		2.3
Arithmetic Reasoning	San Mateo 2nd	Mex-Am	8	34.50	38.25	36.01	2.11	.996	2.5
	San Rafael 2nd		13	21.85	32.54	33.92	3.99		1.9
Arithmetic Fundamentals	San Mateo 2nd	Mex-Am	8	37.38	42.50	42.45	.50	.01	3.0
	San Rafael 2nd		13	36.62	42.46	42.49	1.65		2.9
Total Arithmetic	San Mateo 2nd	Mex-Am	8	71.88	80.75	78.49	1.92	.73	2.7
	San Rafael 2nd		13	58.46	75.00	76.39	5.20		2.3
Mechanics of English	San Mateo 2nd	Mex-Am	8	32.88	44.75	43.81	5.12	.82	2.3
	San Rafael 2nd		13	30.08	40.46	41.04	7.23		2.1
Spelling	San Mateo 2nd	Mex-Am	8	3.78	6.75	6.16	2.05	5.24	2.1
	San Rafael 2nd		13	2.38	9.54	9.90	4.16		2.6
Total Language	San Mateo 2nd	Mex-Am	8	36.25	51.50	50.57	5.22	.00	2.3
	San Rafael 2nd		13	32.46	50.00	50.57	9.37		2.2
Total Battery	San Mateo 2nd	Mex-Am	8	165.75	209.25	202.50	11.88	.00	2.5
	San Rafael 2nd		13	139.23	198.08	202.23	20.59		2.3

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	San Mateo 2nd	Mex-Am	8	52.19	62.75	62.02	4.97	6.72*	2.3
	Seboyeta 2nd		9	50.56	56.00	56.65	12.49		1.9
Reading Comprehension	San Mateo 2nd	Mex-Am	8	4.50	11.75	11.49	2.22	9.13**	2.4
	Seboyeta 2nd		9	3.89	6.22	6.45	4.78		1.7
Total Reading	San Mateo 2nd	Mex-Am	8	56.50	74.50	73.49	6.44	14.97**	2.4
	Seboyeta 2nd		9	54.44	62.22	63.12	15.84		1.9
Arithmetic Reasoning	San Mateo 2nd	Mex-Am	8	34.50	38.25	35.56	2.11	.01	2.5
	Seboyeta 2nd		9	22.67	33.44	35.83	6.02		2.0
Arithmetic Fundamentals	San Mateo 2nd	Mex-Am	8	37.38	42.50	42.30	.50	1.97	3.0
	Seboyeta 2nd		9	32.67	41.11	41.29	1.79		2.7
Total Arithmetic	San Mateo 2nd	Mex-Am	8	71.88	80.75	77.89	1.92	.16	2.7
	Seboyeta 2nd		9	55.22	74.56	77.10	6.62		1.6
Mechanics of English	San Mateo 2nd	Mex-Am	8	32.88	44.75	42.00	5.12	.00	2.3
	Seboyeta 2nd		9	28.00	39.56	42.00	12.47		2.0
Spelling	San Mateo 2nd	Mex-Am	8	3.38	6.75	5.76	2.05	.29	2.1
	Seboyeta 2nd		9	1.89	5.67	6.55	4.78		2.0
Total Language	San Mateo 2nd	Mex-Am	8	36.25	51.50	47.74	5.22	.05	2.3
	Seboyeta 2nd		9	29.89	45.22	48.56	15.65		2.0
Total Battery	San Mateo 2nd	Mex-Am	8	164.75	209.25	199.06	11.88	1.13	2.5
	Seboyeta 2nd		9	140.67	182.00	191.06	36.90		2.0

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	San Mateo 2nd	Mex-Am	8	52.13	62.75	56.55	4.97	.86	2.3
	Sierra Vista 2nd		34	39.26	58.15	59.61	10.88		2.0
Reading Comprehension	San Mateo 2nd	Mex-Am	8	4.50	11.75	10.19	2.22	2.79	2.4
	Sierra Vista 2nd		34	2.32	7.21	7.57	4.28		1.8
Total Reading	San Mateo 2nd	Mex-Am	8	56.50	74.50	65.40	6.44	.29	2.4
	Sierra Vista 2nd		34	41.59	65.35	67.49	13.95		2.0
Arithmetic	San Mateo 2nd	Mex-Am	8	34.50	38.25	29.18	2.11	3.62	2.5
	Sierra Vista 2nd		34	20.68	31.79	33.93	6.64		1.9
Arithmetic Fundamentals	San Mateo 2nd	Mex-Am	8	37.38	42.50	38.21	.50	.02	3.0
	Sierra Vista 2nd		34	25.38	36.91	37.92	8.13		2.0
Total Arithmetic	San Mateo 2nd	Mex-Am	8	71.88	80.75	68.34	1.92	.91	2.7
	Sierra Vista 2nd		34	47.21	68.71	71.63	13.68		2.0
Mechanics of English	San Mateo 2nd	Mex-Am	8	32.88	44.75	38.80	5.12	.26	1.7
	Sierra Vista 2nd		34	26.38	39.62	41.02	13.73		1.5
Spelling	San Mateo 2nd	Mex-Am	8	3.38	6.75	5.31	2.05	6.19	2.1
	Sierra Vista 2nd		34	2.12	7.88	8.22	4.18		2.2
Total Language	San Mateo 2nd	Mex-Am	8	36.25	51.50	43.45	5.22	1.49	2.3
	Sierra Vista 2nd		34	28.50	47.50	49.39	16.83		2.1
Total Battery	San Mateo 2nd	Mex-Am	8	164.75	209.25	172.05	11.88	3.92	2.5
	Sierra Vista 2nd		34	117.00	182.65	191.40	41.47		2.0

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev.	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	San Rafael 2nd	Mex-Am	13	45.38	63.69	65.54	5.72	38.93**	2.3
	Seboyeta 2nd		9	50.56	56.00	53.33	12.49		1.9
Reading Comprehension	San Rafael 2nd	Mex-Am	13	2.92	9.38	9.62	3.39	4.62*	2.0
	Seboyeta 2nd		9	3.89	6.22	5.89	4.78		1.7
Total Reading	San Rafael 2nd	Mex-Am	13	48.31	73.08	75.31	8.24	28.12**	2.3
	Seboyeta 2nd		9	54.44	62.22	59.00	15.84		1.9
Arithmetic Reasoning	San Rafael 2nd	Mex-Am	13	21.85	32.54	32.68	3.99	.10	1.9
	Seboyeta 2nd		9	22.67	33.44	33.24	6.02		2.0
Arithmetic	San Rafael 2nd	Mex-Am	13	36.62	42.46	42.30	1.65	1.46	2.0
	Seboyeta 2nd		9	32.67	41.11	41.35	1.79		1.7
Total Arithmetic	San Rafael 2nd	Mex-Am	13	58.46	75.00	74.56	5.20	.10	2.3
	Seboyeta 2nd		9	55.22	74.56	75.19	6.62		2.3
Mechanics of English	San Rafael 2nd	Mex-Am	13	30.08	40.46	39.64	7.23	.11	2.1
	Seboyeta 2nd		9	28.00	39.56	40.74	12.47		2.0
Spelling	San Rafael 2nd	Mex-Am	13	2.38	9.54	9.18	4.16	4.47*	2.5
	Seboyeta 2nd		9	1.89	5.67	6.19	4.78		1.9
Total Language	San Rafael 2nd	Mex-Am	13	32.46	50.00	48.87	9.37	.24	2.2
	Seboyeta 2nd		9	29.89	45.22	46.86	15.65		2.2
Total Battery	San Rafael 2nd	Mex-Am	13	139.23	198.08	198.54	20.59	4.85*	2.3
	Seboyeta 2nd		9	140.67	182.00	181.33	36.90		2.0

TABLE XII - Continued

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	San Rafael 2nd	Mex-Am	13	45.38	63.69	61.02	5.72	.56	2.3
	Sierra Vista 2nd		34	39.26	58.15	59.17	10.88		2.0
Reading Comprehension	San Rafael 2nd	Mex-Am	13	2.92	9.38	9.08	3.39	1.90	2.0
	Sierra Vista 2nd		34	2.32	7.21	7.32	4.28		1.8
Total Reading	San Rafael 2nd	Mex-Am	13	48.31	73.08	69,45	8.24	.79	2.3
	Sierra Vista 2nd		34	41.59	65.35	66.74	13.95		2.0
Arithmetic Reasoning	San Rafael 2nd	Mex-Am	13	21.85	32.54	31.96	3.99	.001	1.9
	Sierra Vista 2nd		34	20.68	31.79	32.02	6.64		1.9
Arithmetic Fundamentals	San Rafael 2nd	Mex-Am	13	36.62	42.46	38.93	1.65	.12	2.9
	Sierra Vista 2nd		34	25.38	36.91	38.26	8.13		2.0
Total Arithmetic	San Rafael 2nd	Mex-Am	13	58.46	75.00	70.11	5.20	.03	2.3
	Sierra Vista 2nd		34	47.21	68.71	70.58	13.68		2.0
Mechanics of English	San Rafael 2nd	Mex-Am	13	30.08	40.46	37.58	7.23	.82	2.1
	Sierra Vista 2nd		34	26.38	39.62	40.72	13.73		2.0
Spelling	San Rafael 2nd	Mex-Am	13	2.38	9.54	9.21	4.16	1.48	2.6
	Sierra Vista 2nd		34	2.12	7.88	8.01	4.18		2.2
Total Language	San Rafael 2nd	Mex-Am	13	32.46	50.00	46.40	9.37	.39	2.2
	Sierra Vista 2nd		34	28.50	47.50	48.87	16.83		2.1
Total Battery	San Rafael 2nd	Mex-Am	13	139.23	198.08	182.84	20.59	.56	2.3
	Sierra Vista 2nd		34	117.00	182.65	188.47	41.47		2.0

TABLE XII - Continued

Variable	School & Grade Level		Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj. Post-Test Mean	St'd Dev	F Ratio	Post-Test Grade Level Placement
Reading Vocabulary	Seboyeta	2nd	Mex-Am	9	50.56	56.00	50.05	12.49	9.55**	1.9
	Sierra Vista	2nd		34	39.26	58.15	59.72	10.88		2.0
Reading Comprehension	Seboyeta	2nd	Mex-Am	9	3.89	6.22	5.10	4.78	2.57	1.7
	Sierra Vista	2nd		34	2.32	7.21	7.50	4.28		1.8
Total Reading	Seboyeta	2nd	Mex-Am	9	54.44	62.22	54.01	15.84	13.81**	1.9
	Sierra Vista	2nd		34	41.59	65.35	67.53	13.95		2.0
Arithmetic Reasoning	Seboyeta	2nd	Mex-Am	9	22.67	33.44	32.28	6.02	.01	2.0
	Sierra Vista	2nd		34	20.68	31.79	32.10	6.64		1.9
Arithmetic Fundamentals	Seboyeta	2nd	Mex-Am	9	32.67	41.11	38.76	1.79	.32	2.7
	Sierra Vista	2nd		34	25.38	36.91	37.53	8.13		2.0
Total Arithmetic	Seboyeta	2nd	Mex-Am	9	55.22	74.56	70.90	6.62	.17	2.3
	Sierra Vista	2nd		34	47.21	68.71	69.67	13.68		2.0
Mechanics of English	Seboyeta	2nd	Mex-Am	9	28.00	39.56	38.07	12.47	.24	2.0
	Sierra Vista	2nd		34	26.38	39.62	40.01	13.73		2.0
Spelling	Seboyeta	2nd	Mex-Am	9	1.89	5.67	5.97	4.78	3.23	2.0
	Sierra Vista	2nd		34	2.12	7.88	7.80	7.80	4.18	2.2
Total Language	Seboyeta	2nd	Mex-Am	9	29.89	45.22	43.76	15.65	.93	2.0
	Sierra Vista	2nd		34	28.50	47.50	47.89	16.83		2.0
Total Battery	Seboyeta	2nd	Mex-Am	9	140.67	182.00	164.20	36.90	8.06**	2.0
	Sierra Vista	2nd		34	117.00	182.65	187.36	41.47		2.0

Experimental Effects on Personal-Social Responsiveness, Associative Vocabulary, Concept Activation-Numerical, and Concept Activation-Sensory

The Caldwell Test was administered to a sample of first grade Mexican American children in the San Mateo, San Rafael, and Sierra Vista schools to determine experimental group gains and differences in four variables.

Table XIII shows the mean difference (pre-test versus post-test) among first grade Mexican American children in the San Mateo School. Except in Associative Vocabulary, the pre-test versus post-test difference in the other Caldwell Test variables are relatively small. Similar results were noted among first grade Mexican American children in the San Rafael and Sierra Vista schools. Only one other pre-test versus post-test difference is found among the experimental group children in the San Rafael School; this occurred in Concept Activation-Numerical, with a significant gain indicated at the .05 level of confidence.

Analyses of covariance were performed to determine the significant differences between the experimental groups relative to the Caldwell Test variables. Significant differences occurred in only two of the statistical comparisons. In observing the data in Table XIV, the San Mateo experimental group (post-test) means were significantly higher (.05 level of confidence) in Associative Vocabulary and Concept Activation-numerical as compared to the San Rafael experimental (post-test) group means. Otherwise, the mean differences between the three experimental groups appear relative minute.

The purpose of the Caldwell Test is to provide additional data in cognitive development among first grade children, with Spanish used as a

language medium. Since the test does not require reading knowledge in the pre-testing, it can be used in terms of a pre-test/post-test comparison at the pre-school and first grade levels. The statistical findings show that, in general, the experimental group children scored at least at the 50 percent level in the pre-test. Thus, while experimental group gains were not consistently indicated, it is conceivable that the concepts in the remaining fifty percent portion of the test are not included in the program content and experiences of the children. It is also noteworthy that the children were responding correctly at the 50 percent level to the pre-test items presented in Spanish. This clearly reveals that Mexican American children in the Grants area, on the average, enter school with some Spanish speaking background. With this type of structural and phonetic language reference found among these children, it is concluded that a Spanish/English bilingual program is a highly relevant curriculum component in the Grants School District.

TABLE XIII - EXPERIMENTAL GROUP PRE-/POST TEST CHANGES IN FOUR COGNITIVE VARIABLES, BASED ON THE CALDWELL TEST--SPANISH VERSION

Variable	School & Grade Level	Ethnic Group	N	Pre/Post Test Means	St'd Dev.	F Ratio	% Change
Personal - Social Responsiveness	San Mateo 1st	Hispano	7	14.86	2.23	1.94	12.50
			7	16.71	2.37		
Associative Vocabulary			7	4.29	4.16	4.78*	126.67
			7	9.71	4.43		
Concept Activation Numerical			7	12.14	2.17	1.42	10.59
			7	13.43	1.50		
Concept Activation Sensory			7	14.43	2.92	3.23	16.83
			7	16.86	1.55		
Total			7	45.71	7.07	5.84*	24.06
			7	56.71	8.61		
Personal - Social	San Rafael 1st	Hispano	17	13.76	6.31	.38	9.83
			17	15.12	6.07		
Associative Vocabulary			17	4.24	4.57	.86	33.33
			17	5.65	4.00		
Concept Activation Numerical			17	10.24	5.23	5.62*	36.21
			17	13.94	3.42		
Concept Activation Sensory			17	13.59	4.59	.00	.43
			17	13.65	3.38		
Total			17	41.24	17.48	1.69	17.55
			17	48.47	13.75		

TABLE XIII (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre/Post Test Means	St'd Dev.	F Ratio	% Change
Personal - Social Responsiveness	Sierra Vista 1st	Hispano	12 12	15.42 15.25	4.59 2.59	.01	-1.08
Associative Vocabulary			12 12	7.50 7.58	5.55 6.64	.00	1.11
Concept Activation Numerical			12 12	10.33 13.33	4.57 2.87	3.40	29.03
Concept Activation Sensory			12 12	14.33 15.17	2.66 2.51	.57	5.81
Total			12 12	47.17 51.33	16.71 12.12	.44	8.83

Table XIV - EXPERIMENTAL GROUP DIFFERENCES IN FOUR COGNITIVE VARIABLES, BASED ON THE CALDWELL TEST--SPANISH VERSION

Variable	School and Grade Level	Ethnic Group	N	Pre-Test Mean	Post Test Mean	Post Test Mean	St'd Dev.	F Ratio
Personal - Social Responsiveness	San Mateo 1st	Hispano	7	14.86	16.71	16.29	2.37	.23
	San Rafael 1st		17	13.76	15.12	15.29	6.07	
Associative Vocabulary	San Mateo 1st	Hispano	7	4.29	9.71	9.71	4.43	4.26*
	San Rafael 1st		17	4.24	5.65	5.65	4.00	
Concept Activation Numerical	San Mateo 1st	Hispano	7	12.14	13.43	12.79	1.50	1.96
	San Rafael 1st		17	10.24	13.94	14.20	3.42	
Concept Activation Sensory	San Mateo 1st	Hispano	7	14.43	16.86	16.64	1.55	5.62*
	San Rafael 1st		17	13.59	13.65	13.74	3.38	
Total	San Mateo 1st	Hispano	7	45.71	56.71	55.13	8.61	1.57
	San Rafael 1st		17	41.24	48.47	49.12	13.75	
Personal - Social Responsiveness	San Mateo 1st	Hispano	7	14.86	16.71	16.83	2.37	2.16
	Sierra Vista 1st		12	15.42	15.25	15.18	2.59	
Associative Vocabulary	San Mateo 1st	Hispano	7	4.29	9.71	11.14	4.43	2.95
	Sierra Vista 1st		12	7.50	7.58	6.75	6.64	
Concept Activation Numerical	San Mateo 1st	Hispano	7	12.14	13.43	13.07	1.50	.17
	Sierra Vista 1st		12	10.33	13.33	13.54	2.87	
Concept Activation Sensory	San Mateo 1st	Hispano	7	14.43	16.86	16.84	1.55	2.52
	Sierra Vista 1st		12	14.33	15.17	15.18	2.51	
Total	San Mateo 1st	Hispano	7	45.71	56.71	57.20	8.61	2.15
	Sierra Vista 1st		12	47.17	51.33	51.05	12.12	

TABLE XIV (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Personal - Social Responsiveness	San Rafael 1st	Hispano	17	13.76	15.12	15.43	6.07	.13
	Sierra Vista 1st		12	15.42	15.25	14.81	2.59	
Associative Vocabulary	San Rafael 1st	Hispano	17	4.24	5.65	6.22	4.00	.08
	Sierra Vista 1st		12	7.50	7.58	6.77	6.64	
Concept Activation Numerical	San Rafael 1st	Hispano	17	10.24	13.94	13.96	3.42	.47
	Sierra Vista 1st		12	10.33	13.33	13.31	2.87	
Concept Activation Sensory	San Rafael 1st	Hispano	17	13.59	13.65	13.75	3.38	1.33
	Sierra Vista 1st		12	14.33	15.17	15.02	2.51	
Total	San Rafael 1st	Hispano	17	41.24	48.47	49.70	13.75	.00
	Sierra Vista 1st		12	47.17	51.33	49.59	12.12	

Experimental Group Perceptions About Relationships of Children from Three American Cultural Groups.

The Cultural Sensitivity Instrument was administered to determine experimental children's perceptions about relationships between children from three American cultural groups. For example, Table XV shows the mean scores of experimental group children by ethnic group in each of the schools in the bilingual project with reference to their perceptions about the relationship between children from three cultural groups--Anglo American, American Indian, and Mexican American.

The data given in Table XV show only two significant changes in attitude (pre- versus post-test) in all of the statistical comparisons. These differences are noted among first grade Mexican American children's (San Rafael) perceptions on the relationship between Anglo American children with American Indian children and vice-versa. Specifically, the data show significant drops (toward the negative attitudinal dimension) at the .01 and .05 level of confidence. Since these were the only two significant changes in perceptions noted among all of the statistical comparisons, it can be concluded that these significant findings are not generalizable among the San Rafael children.

Additional observations were performed among second grade children from the three cultural groups in the project schools. Again, the findings reflect insignificant changes in perceptions on a pre- versus post-test comparison. While some small mean drops are found, it is noted that the majority of the mean changes, while insignificant at the .05 level of confidence, tend to be in the positive direction.

Table XVI illustrates the statistical findings relative to the same cultural sensitivity variables with each cultural group and grade level held constant across all of the schools. In reference to Table XVI, three significant changes in perceptions are found and all are in the positive direction. The first relates to second grade Anglo American children's perceptions about the relationship of Mexican American children with Anglo American children, the second refers to second grade Anglo American children's perceptions about the relationship of Anglo American children with American Indian children, and the third relates to second grade Mexican American children's perceptions about the relationship of Mexican American children with Mexican American children. The significance differences in the findings are noted at the .01 and .05 level of confidence respectively. The majority of the comparisons given in Table XVI, while not significant at the .05 level of confidence, reveal a positive trend in perceptions among the children from the three ethnic groups.

Table XVII shows the statistical results relative to the same cultural sensitivity variables, with each school and grade level held constant across the three ethnic groups. Three significant changes in perceptions are found among second graders in two of the schools. In the Cubero school, the second grade experimental group perceptions about the relationship of Mexican American children with Anglo American children changed significantly (positively at the .05 level of confidence) in terms of the pre-/post-test comparison. And in the San Rafael school, the perceptions of second grade children about the relationship of Mexican American children with Mexican American children,

as well as their perceptions about the relationship of Mexican American children with Anglo American children, changed significantly (positively at the .01 and .05 level of confidence) in terms of the pre-/post-test comparison. The majority of the other changes in perceptions found in Table XVII, while not significant at the .05 level of confidence, tend to place in the positive direction.

Statistical analyses were performed to determine the significant difference between the experimental groups among the various schools in the project, with reference to the variables measured by the Cultural Sensitivity Test. Table XVII shows the statistical findings based on analyses of covariance. Variances between the experimental means in all of the comparisons are clearly insignificant, based on a probability statistical reference at the .05 level of confidence. In essence, this means that children's perceptions about the relationship between children in the three cultural groups tend to be relatively similar.

Two noteworthy findings are revealed in the statistical analyses based on the cultural sensitivity measure. The experimental group children's perceptions about the relationship of children in the three cultural groups tend to change in the positive direction over an eight month period. Further study is suggested to determine the degree of attitudinal change over a longer period of time. Second, it is found that, in general, the experimental children's perceptions about the relationship between the three cultural groups place in the favorable side of the sensitivity scale. With 510 representing the maximum score and 255 the mid-point (separating the favorable dimension from the

unfavorable category), it is noted that none of the experimental group means are found below the mid-point reference area.

TABLE XV - EXPERIMENTAL GROUP PERCEPTIONS ABOUT RELATIONSHIPS OF CHILDREN FROM THREE AMERICAN CULTURAL GROUPS, BY SCHOOL, GRADE LEVEL AND ETHNIC GROUPS

Variable	School & Grade Level	Ethnic Group	N	Pre/Post Test Means	St'd Dev.	F Ratio	% Change
Mex-American	San Rafael 1st	Anglo	5	315.20	168.28	2.18	40.86
Mex-American		American	5	444.00	45.65		
Mex-American			5	390.40	107.75	.63	11.17
Anglo American			5	434.00	17.72		
Mex-American			5	395.60	137.57	.34	-12.29
American Indian			5	347.00	91.74		
Anglo-American			5	396.60	96.62	.06	- 4.44
Mex-American			5	379.00	99.92		
Anglo-American			5	374.40	161.43	.56	16.99
Anglo American			5	438.00	48.33		
Anglo American			5	286.40	199.32	.16	15.92
American Indian			5	332.00	100.53		
American Indian			5	367.60	101.35	2.06	20.24
Mex-American			5	442.00	20.88		
American Indian			5	365.20	144.91	.17	9.80
Anglo American			5	401.00	86.86		
American Indian			5	438.40	105.12	.01	1.73
American Indian			5	446.00	42.94		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	San Mateo 1st	Mexican	11	429.45	68.58	.30	3.62
Mexican American		American	11	445.00	55.76		
Mexican American			11	399.64	85.17	.50	6.01
Anglo American			11	423.64	64.78		
Mexican American			11	418.45	76.79	.25	-4.52
American Indian			11	399.55	89.00		
Anglo American			11	408.45	83.10	.06	-2.52
Mexican American			11	398.18	95.92		
Anglo American			11	394.64	71.21	1.55	8.96
Anglo American			11	430.00	54.44		
Anglo American			11	412.09	106.73	.59	-8.34
American Indian			11	377.73	91.54		
American Indian			11	409.55	69.58	.11	-3.00
Mexican American			11	397.27	88.79		
American Indian			11	389.55	111.59	.00	.58
Anglo American			11	391.82	115.57		
American Indian			11	430.27	63.07	.14	-2.81
American Indian			11	418.18	79.26		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	San Rafael 1st	Mexican	19	437.53	64.60	.98	-5.51
Mexican American		American	19	413.42	80.39		
Mexican American			19	437.42	65.04	2.67	-8.62
Anglo American			19	399.74	73.03		
Mexican American			19	435.89	56.36	3.35	-9.86
American Indian			19	392.89	82.12		
Anglo American			19	433.37	71.48	2.62	-9.64
Mexican American			19	391.58	82.86		
Anglo American			19	459.89	47.45	2.09	-9.30
Anglo American			19	417.11	116.20		
Anglo American			19	438.11	66.90	8.66**	-18.55
American Indian			19	356.84	96.10		
American Indian			19	434.68	60.47	.39	-3.26
Mexican American			19	420.53	73.21		
American Indian			19	444.89	61.44	4.24*	-10.74
Anglo American			19	397.11	76.83		
American Indian			19	451.58	51.33	2.70	-7.34
American Indian			19	418.42	68.35		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	Pre-/Post N	Test Means	St'd Dev	F Ratio	% Change
Mexican American	Cubero 2nd	American	9	446.33	51.76	3.51	8.29
Mexican American		Indian	9	483.33	20.95		
Mexican American			9	405.00	106.75	3.20	17.15
Anglo American			9	474.44	25.43		
Mexican American			9	393.11	116.70	.40	7.55
American Indian			9	422.78	62.63		
Anglo American			9	395.67	102.67	1.16	12.33
Mexican American			9	444.44	75.74		
Anglo American			9	447.67	58.49	.36	4.00
Anglo American			9	465.56	60.07		
Anglo American			9	362.56	117.74	1.93	18.14
American Indian			9	428.33	63.20		
American Indian			9	394.00	94.10	2.11	14.35
Mexican American			9	450.56	56.98		
American Indian			9	392.67	85.90	1.98	13.04
Anglo American			9	443.89	58.01		
American Indian			9	410.22	95.31	.30	5.23
American Indian			9	431.67	54.77		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	Cubero 2nd	Mexican	7	451.57	47.08	.00	-.03
Mexican American		American	7	451.43	69.32		
Mexican American			7	426.57	84.83	1.00	9.68
Anglo American			7	467.86	54.30		
Mexican American			7	389.29	78.15	.09	4.40
American Indian			7	406.43	109.96		
Anglo American			7	431.86	53.75	.12	3.21
Mexican American			7	445.71	77.66		
Anglo American			7	452.86	56.82	.16	2.68
Anglo American			7	465.00	45.51		
Anglo American			7	381.00	88.53	.52	11.17
American Indian			7	423.57	113.95		
American Indian			7	427.86	77.12	.21	4.51
Mexican American			7	447.14	65.68		
American Indian			7	412.00	94.69	.96	11.13
Anglo American			7	457.86	63.74		
American Indian			7	465.00	43.46	.20	-4.45
American Indian			7	444.29	104.18		

TABLE XVI - EXPERIMENTAL GROUP RECEPTIONS ABOUT RELATIONSHIPS OF CHILDREN FROM THREE AMERICAN CULTURAL GROUPS, BY SCHOOL AND GRADE LEVEL (ETHNIC GROUPS COMBINED)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	All - 1st	Mexican	34	433.94	66.20	.11	-1.31
Mexican American		American	34	428.24	72.73		
Mexican American			34	419.12	76.60	.00	-.11
Anglo American			34	418.68	72.55		
Mexican American			34	417.59	92.42	1.11	-5.44
American Indian			34	394.85	82.30		
Anglo American			34	416.44	77.13	.77	-4.30
Mexican American			34	398.53	87.80		
Anglo American			34	431.97	62.46	.19	-2.06
Anglo American			34	423.09	96.92		
Anglo American			34	413.82	93.75	2.80	-9.50
American Indian			34	374.56	96.57		
American Indian			34	415.62	67.80	.00	.38
Mexican American			34	417.21	79.41		
American Indian			34	405.03	103.52	.19	-2.62
Anglo American			34	394.41	93.12		
American Indian			34	435.91	59.26	.39	-2.33
American Indian			34	425.74	71.75		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	San Mateo 2nd	Mexican	8	424.25	72.21	.52	5.92
Mexican American		American	8	449.38	56.20		
Mexican American			8	434.25	58.51	.24	-4.58
Anglo American			8	414.38	88.79		
Mexican American			8	413.25	113.96	.00	.73
American Indian			8	416.25	60.56		
Anglo American			8	389.13	120.40	.06	-4.27
Mexican American			8	372.50	116.81		
American Anglo			8	476.75	45.53	.03	.94
American Anglo			8	481.25	47.81		
American Anglo			8	379.25	95.59	.15	-5.08
American Indian			8	360.00	89.90		
American Indian			8	409.25	59.00	.91	6.75
Mexican American			8	436.90	48.73		
American Indian			8	371.00	140.49	.47	11.35
Anglo American			8	413.13	80.27		
American Indian			8	421.50	73.71	.60	6.47
American Indian			8	448.75	56.22		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	Seboyeta 2nd	Mexican	10	401.40	88.92	.55	7.25
Mexican American		American	10	430.50	76.73		
Mexican American			10	445.70	71.45	.19	-3.41
Anglo American			10	430.50	72.99		
Mexican American			10	382.30	70.41	.93	7.51
American Indian			10	411.00	54.35		
Anglo American			10	398.80	88.44	.78	7.95
Mexican American			10	430.50	60.89		
Anglo American			10	419.60	69.99	2.26	10.34
Anglo American			10	463.00	51.00		
Anglo American			10	339.80	70.21	.00	.31
American Indian			10	391.00	83.21		
American Indian			10	411.60	74.86	.56	6.29
Mexican American			10	437.50	71.00		
American Indian			10	375.40	81.38	.72	8.55
Anglo American			10	407.50	78.59		
American Indian			10	411.50	67.84	1.31	7.90
			10	444.00	51.27		

TABLE XV - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	Sierra Vista 2nd	Mexican	8	345.13	61.23	1.82	16.26
Mexican American		American	8	401.25	91.30		
Mexican American			8	359.63	100.87	.00	-.07
Anglo American			8	359.38	109.96		
Mexican American			8	307.75	84.37	1.29	18.20
American Indian			8	363.75	99.24		
Anglo American			8	298.50	97.07	.86	15.37
Mexican American			8	344.38	86.80		
Anglo American			8	402.88	75.83	.00	-.25
Anglo American			8	401.88	87.93		
Anglo American			8	289.63	65.30	.11	6.82
American Indian			8	309.38	140.57		
American Indian			8	346.00	66.94	.62	10.37
Mexican American			8	381.88	99.94		
American Indian			8	295.63	85.54	.17	8.25
Anglo American			8	320.00	127.84		
American Indian			8	400.00	89.29	.00	1.25
American Indian			8	405.00	98.87		

TABLE XVI - (Continued)

Variable	School & Grade Level	Rhnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	All - 1st	Anglo	5	315.20	168.28	2.18	40.86
Mexican American		American	5	444.00	45.65		
Mexican American			5	390.40	107.75	.63	11.17
Anglo American			5	434.00	17.72		
Mexican American			5	395.60	137.57	.34	-12.29
American Indian			5	347.00	91.74		
Anglo American			5	396.60	96.62	.06	-4.44
Mexican American			5	379.00	99.92		
Anglo American			5	374.40	161.43	.56	16.99
Anglo American			5	438.00	48.33		
Anglo American			5	286.40	199.32	.16	15.92
American Indian			5	332.00	100.53		
American Indian			5	367.60	101.35	2.06	20.24
Mexican American			5	442.00	20.88		
American Indian			5	365.20	144.91	.17	9.80
Anglo American			5	401.00	86.86		
American Indian			5	438.40	105.12	.01	1.73
American Indian			5	446.00	42.94		

TABLE XVI - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev	F Ratio	% Change
Mexican American	All - 2nd	American	16	435.06	65.12	1.56	5.80
Mexican American		Indian	16	460.31	43.39		
Mexican American			16	411.19	93.90	1.38	8.45
Anglo American			16	445.94	65.08		
Mexican American			16	379.81	102.16	.31	4.90
American Indian			16	398.44	77.15		
Anglo American			16	384.56	102.50	2.41	12.87
Mexican American			16	434.06	68.49		
Anglo American			16	432.56	68.35	.17	2.51
Anglo American			16	443.44	72.75		
Anglo American			16	358.25	105.96	2.43	15.23
American Indian			16	412.81	84.45		
American Indian			16	399.56	88.17	1.77	9.81
Mexican American			16	438.75	72.19		
American Indian			16	396.88	88.36	1.99	9.53
Anglo American			16	434.69	54.47		
American Indian			16	399.19	93.74	.48	5.84
American Indian			16	422.50	89.32		

TABLE XVI - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	All - 2nd	Anglo	7	402.86	65.57	4.39	17.02
Mexican American		American	7	471.43	46.04		
Mexican American			7	341.43	91.91	11.50**	39.33
Anglo American			7	475.71	30.87		
Mexican American			7	396.57	77.67	.88	10.59
American Indian			7	438.57	76.61		
Anglo American			7	339.43	113.18	.68	16.58
Mexican American			7	395.71	121.70		
Anglo American			7	436.00	72.80	.16	5.18
Anglo American			7	458.57	113.91		
Anglo American			7	311.00	117.30	4.73*	37.57
American Indian			7	427.86	59.63		
American Indian			7	421.71	83.61	.31	5.52
Mexican American			7	445.00	56.82		
American Indian			7	344.57	98.35	1.34	17.74
Anglo American			7	405.71	84.03		
American Indian			7	392.14	90.13	.70	10.56
			7	433.57	80.79		

TABLE XVI - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	All - 2nd	Mexican	37	398.14	78.92	4.11*	9.29
Mexican American		American	37	435.14	75.78		
Mexican American			37	415.62	86.98	.19	2.22
Anglo American			37	424.86	90.21		
Mexican American			37	368.92	101.02	3.00	10.33
American Indian			37	407.03	84.68		
Anglo American			37	379.92	101.12	1.18	6.57
Mexican American			37	404.86	93.28		
Anglo American			37	435.65	71.19	2.05	5.31
Anglo American			37	458.78	65.78		
Anglo American			37	353.81	95.00	.67	5.76
American Indian			37	374.19	113.87		
American Indian			37	401.22	78.85	2.44	7.07
Mexican American			37	429.59	75.12		
American Indian			37	366.51	108.51	2.25	10.21
Anglo American			37	403.92	102.79		
American Indian			37	410.16	88.62	1.89	6.65
American Indian			37	437.43	79.05		

TABLE XVII - EXPERIMENTAL GROUP PERCEPTIONS ABOUT RELATIONSHIP OF CHILDREN FROM THREE AMERICAN CULTURAL GROUPS BY ETHNIC GROUP AND GRADE LEVEL (ALL SCHOOLS COMBINED)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	San Mateo 1st	All	11	429.45	78.58	.30	3.62
Mexican American			11	445.00	55.76		
Mexican American			11	399.64	85.17	.50	6.01
Anglo American			11	423.64	64.78		
Mexican American			11	418.45	76.79	.25	-4.52
American Indian			11	399.55	89.00		
Anglo American			11	408.45	83.10	.06	-2.52
Mexican American			11	398.18	95.92		
Anglo American			11	394.64	71.21	1.55	8.96
Anglo American			11	430.00	54.44		
Anglo American			11	412.09	106.73	.59	-8.34
American Indian			11	377.73	91.54		
American Indian			11	409.55	69.58	.11	-3.00
Mexican American			11	397.27	88.79		
American Indian			11	389.55	111.59	.00	.58
Anglo American			11	391.82	115.57		
American Indian			11	430.27	63.07	.14	-2.81
American Indian			11	418.18	79.27		

TABLE XVII - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	San Rafael 1st	All	24	412.04	108.03	.07	.07
Mexican American			24	419.79	75.53		
Mexican American			24	427.63	78.31	.93	-4.85
Anglo American			24	406.88	66.94		
Mexican American			24	427.50	82.01	3.16	-10.33
American Indian			24	383.33	86.25		
Anglo American			24	425.71	78.82	2.25	-8.63
Mexican American			24	388.96	86.84		
Anglo American			24	442.08	91.74	.49	-4.67
Anglo American			24	421.46	106.06		
Anglo American			24	406.50	124.96	2.75	-13.49
American Indian			24	351.67	97.56		
American Indian			24	420.71	76.01	.04	1.02
Mexican American			24	425.00	66.41		
American Indian			24	428.29	91.71	1.44	-7.09
Anglo American			24	397.92	79.04		
American Indian			24	448.83	66.46	1.62	-5.50
American Indian			24	424.17	64.87		

TABLE XVII - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	Cubero 2nd	All	17	450.12	48.72	1.52	4.81
Mexican American			17	471.76	59.38		
Mexican American			17	406.94	100.02	5.11*	15.06
Anglo American			17	468.24	41.76		
Mexican American			17	396.71	100.86	.47	5.72
American Indian			17	419.41	85.71		
Anglo American			17	398.53	98.82	2.08	11.22
Mexican American			17	443.24	74.64		
Anglo American			17	448.29	56.48	1.01	4.38
Anglo American			17	467.94	53.61		
Anglo American			17	368.41	103.55	2.93	15.68
American Indian			17	426.18	86.41		
American Indian			17	411.41	86.66	2.28	9.67
Anglo American			17	451.18	59.74		
American Indian			17	391.00	96.57	3.82	14.26
Anglo American			17	446.76	60.56		
American Indian			17	436.35	79.73	.00	.63
American Indian			17	439.12	78.45		

TABLE XVII - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	San Mateo 2nd	All	8	424.25	72.21	.52	5.92
Mexican American			8	449.38	56.20		
Mexican American			8	434.25	58.51	.24	-4.58
Anglo American			8	414.38	88.79		
Mexican American			8	413.25	113.96	.00	.73
American Indian			8	416.25	60.56		
Anglo American			8	389.13	120.40	.03	-4.27
Mexican American			8	372.50	116.81		
Anglo American			8	476.75	45.53	.03	.94
Anglo American			8	481.25	47.81		
Anglo American			8	379.25	95.59	.15	-5.08
American Indian			8	360.00	89.90		
American Indian			8	409.25	59.00	.91	6.75
Mexican American			8	436.88	48.74		
American Indian			8	371.00	140.49	.47	11.35
Anglo American			8	413.12	80.27		
American Indian			8	421.50	73.71	.60	6.47
American Indian			8	448.75	56.22		

TABLE XVII - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American Mexican American	San Rafael 2nd	All	7 7	375.14 465.00	50.58 47.96	9.97**	23.95
Mexican American Anglo American			7 7	396.14 484.29	66.76 25.97	9.08*	22.25
Mexican American American Indian			7 7	365.57 464.29	117.40 47.32	3.64	27.00
Anglo American Mexican American			7 7	386.71 451.43	63.75 39.71	4.45	16.73
Anglo American Anglo American			7 7	447.29 504.29	67.59 6.78	4.22	12.74
Anglo American American Indian			7 7	303.86 425.00	119.18 80.45	4.25	39.87
American Indian Mexican American			7 7	442.43 450.71	77.60 29.21	.05	1.87
American Indian Anglo American			7 7	387.29 435.71	85.95 86.54	.94	12.50
American Indian American Indian			7 7	316.43 444.29	114.37 50.39	6.27*	40.41

TABLE XVII -- (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American Mexican American	Seboyeta 2nd	All	14 14	410.43 431.79	86.92 71.50	.46	5.20
Mexican American Anglo American			14 14	431.21 415.71	79.11 82.39	.23	-3.59
Mexican American American Indian			14 14	386.86 408.57	69.89 57.30	.75	5.61
Anglo American Mexican American			14 14	393.86 423.93	102.27 63.73	.80	7.64
Anglo American Anglo American			14 14	431.71 456.43	70.59 54.85	.99	5.72
Anglo American American Indian			14 14	386.36 397.86	78.22 83.42	.13	2.98
American Indian Mexican American			14 14	412.64 440.36	81.37 64.04	.93	6.72
American Indian Anglo American			14 14	387.00 415.00	92.23 72.11	.74	7.24
American Indian American Indian			14 14	407.50 436.07	82.89 83.35	.76	7.01

TABLE XVII - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-/Post Test Means	St'd Dev.	F Ratio	% Change
Mexican American	Sierra Vista	All	14	363.86	71.21	3.38	14.84
Mexican American	2nd		14	417.86	78.23		
Mexican American			14	367.50	106.97	.93	10.79
Anglo American			14	407.14	101.82		
Mexican American			14	319.86	78.03	1.47	13.33
American Indian			14	362.50	99.96		
Anglo American			14	319.79	96.68	1.15	13.58
Mexican American			14	363.21	108.64		
Anglo American			14	391.57	76.71	.02	1.33
Anglo American			14	396.79	105.55		
Anglo American			14	297.64	83.35	1.01	14.59
American Indian			14	341.07	130.82		
American Indian			14	360.57	74.09	1.02	9.85
Mexican American			14	396.07	102.07		
American Indian			14	327.07	91.86	.48	8.76
Anglo American			14	355.71	116.71		
American.Indian			14	399.86	74.26	.05	2.00
American Indian			14	407.86	103.37		

TABLE XVIII - EXPERIMENTAL GROUP DIFFERENCES IN PERCEPTIONS ABOUT RELATIONSHIPS OF CHILDREN FROM THREE AMERICAN CULTURAL GROUPS

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	San Mateo 1st	Mexican	11	429.45	445.00	445.25	55.76	1.22
Mexican American	San Rafael 1st	American	19	437.53	413.42	413.28	80.40	
Mexican American	San Mateo 1st	Mexican	11	399.64	423.64	435.78	64.78	3.09
Anglo American	San Rafael 1st	American	19	437.42	399.74	392.71	73.03	
Mexican American	San Mateo 1st	Mexican	11	418.45	399.55	403.66	88.996	.16
American Indian	San Rafael 1st	American	19	435.89	392.89	390.51	82.12	
Anglo American	San Mateo 1st	Mexican	11	408.45	398.18	398.72	95.92	.044
Mexican American	San Rafeal 1st	American	19	433.37	391.58	391.27	82.86	
Anglo American	San Mateo 1st	Mexican	11	394.64	430.00	437.69	54.44	.32
Anglo American	San Rafael 1st	American	19	459.89	417.11	412.65	16.20	
Anglo American	San Mateo 1st	Mexican	11	412.09	377.73	380.42	91.54	.44
American Indian	San Rafael 1st	American	19	438.11	356.84	355.29	96.098	
American Indian	San Mateo 1st	Mexican	11	409.55	397.27	394.49	88.79	.76
Mexican American	San Rafael 1st	American	19	434.68	420.53	422.18	73.21	
American Indian	San Mateo 1st	Mexican	11	389.55	391.82	396.66	115.57	.003
Anglo American	San Rafael 1st	American	19	444.89	397.11	394.30	76.83	
American Indian	San Mateo 1st	Mexican	11	430.27	418.18	416.73	79.27	.01
American Indian	San Rafael 1st	American	19	451.58	418.42	419.26	68.35	

TABLE XVIII - (Continued)

Variable	School & Grade Level		Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	Cubero	2nd	Mexican	7	451.57	451.43	447.09	69.32	.029
Mexican American	San Mateo	2nd	American	8	424.25	449.38	453.17	56.21	
Mexican American	Cubero	2nd	Mexican	7	426.57	467.86	470.74	54.31	3.43
Anglo American	San Mateo	2nd	American	8	434.25	414.38	411.85	88.79	
Mexican American	Cubero	2nd	Mexican	7	389.29	406.43	407.97	109.96	.02
American Indian	San Mateo	2nd	American	8	413.25	416.25	414.90	60.56	
Anglo American	Cubero	2nd	Mexican	7	431.86	445.71	438.05	77.66	1.09
Mexican American	San Mateo	2nd	American	8	389.13	372.50	379.20	116.81	
Anglo-American	Cubero	2nd	Mexican	7	452.86	465.00	465.44	45.51	.31
Anglo American	San Mateo	2nd	American	8	476.75	481.25	480.86	47.81	
Anglo American	Cubero	2nd	Mexican	7	381.00	423.57	422.82	113.95	2.42
American Indian	San Mateo	2nd	American	8	379.25	360.00	360.66	89.90	
American Indian	Cubero	2nd	Mexican	7	427.86	447.14	442.09	65.68	.00
Mexican American	San Mateo	2nd	American	8	409.25	436.88	441.29	48.73	
American Indian	Cubero	2nd	Mexican	7	412.00	457.86	451.79	63.74	.77
Anglo Americ n	San Mateo	2nd	American	8	371.00	413.13	418.43	80.27	
American Indian	Cubero	2nd	Mexican	7	465.00	444.29	453.98	104.18	.08
American Indian	San Mateo	2nd	American	8	421.50	448.75	440.27	56.22	

TABLE XVIII - (CONTINUED)

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	Cubero 2nd	Mexican	7	457.57	541.43	431.35	69.32	.19
Mexican American	Seboyeta 2nd	American	10	401.40	430.50	444.55	76.73	
Mexican American	Cubero 2nd	Mexican	7	426.57	467.86	475.51	54.31	5.34
Anglo American	Seboyeta 2nd	American	10	445.70	430.50	425.14	72.99	
Mexican American	Cubero 2nd	Mexican	7	389.29	406.43	404.53	109.96	.04
American Indian	Seboyeta 2nd	American	10	382.30	411.00	412.33	54.36	
Anglo American	Cubero 2nd	Mexican	7	431.86	445.71	440.13	77.67	.03
Mexican American	Seboyeta 2nd	American	10	398.80	430.50	434.41	60.89	
Anglo American	Cubero 2nd	Mexican	7	452.86	465.00	457.37	45.52	.22
Anglo American	Seboyeta 2nd	American	10	419.60	463.00	468.34	51.00	
Anglo American	Cubero 2nd	Mexican	7	381.00	423.57	426.71	113.95	.68
American Indian	Seboyeta 2nd	American	10	389.80	391.00	388.80	83.22	
American Indian	Cubero 2nd	Mexican	7	427.86	447.14	443.58	65.68	.01
Mexican American	Seboyeta 2nd	American	10	411.60	437.50	439.99	71.01	
American Indian	Cubero 2nd	Mexican	7	412.00	457.86	455.85	63.75	1.37
Anglo American	Seboyeta 2nd	American	10	375.40	407.50	408.90	78.59	
American Indian	Cubero 2nd	Mexican	7	465.00	444.29	452.34	104.18	.10
American Indian	Seboyeta 2nd	Ameican	10	411.50	440.00	438.36	51.28	

TABLE XVIII - (CONTINUED)

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	Cubero 2nd	Mexican	7	451.57	451.43	403.83	69.32	.52
Mexican American	Sierra Vista 2nd	American	8	345.13	401.25	442.90	91.31	
Mexican American	Cubero 2nd	Mexican	7	426.57	467.86	451.01	54.30	2.67
Anglo American	Sierra Vista 2nd	American	8	359.63	359.38	374.11	109.96	
Mexican American	Cubero 2nd	Mexican	7	389.29	406.43	381.58	109.96	.004
American Indian	Sierra Vista 2nd	American	8	307.75	363.75	385.49	99.24	
Anglo American	Cubero 2nd	Mexican	7	431.86	445.71	401.82	77.66	.14
Mexican American	Sierra Vista 2nd	American	8	298.50	344.38	382.78	86.80	
Anglo American	Cubero 2nd	Mexican	7	452.86	465.00	459.06	45.51	1.46
Anglo American	Sierra Vista 2nd	American	8	402.88	401.88	407.07	87.93	
Anglo American	Cubero 2nd	Mexican	7	381.00	423.57	368.96	113.95	.03
American Indian	Sierra Vista 2nd	American	8	289.63	309.38	357.16	140.57	
American Indian	Cubero 2nd	Mexican	7	427.86	447.14	440.49	65.68	.87
Mexican American	Sierra Vista 2nd	American	8	346.00	381.88	387.70	99.94	
American Indian	Cubero 2nd	Mexican	7	412.00	457.86	424.90	63.74	1.46
Anglo American	Sierra Vista 2nd	American	8	295.63	320.00	348.84	127.84	
American Indian	Cubero 2nd	Mexican	7	465.00	444.29	428.44	104.18	.02
American Indian	Sierra Vista 2nd	American	8	400.00	405.00	418.86	98.87	

TABLE XVIII _ (CONTINUTED)

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	San Mateo 2nd	Mexican	8	424.25	449.38	443.74	56.20	.08
Mexican American	Seboyeta 2nd	American	10	401.40	430.50	435.00	76.73	
Mexican American	San Mateo 2nd	Mexican	8	434.25	414.38	419.52	88.79	.05
Anglo American	Seboyeta 2nd	American	10	445.70	430.50	426.38	72.99	
Mexican American	Sna Mateo 2nd	Mexican	8	413.25	416.25	418.96	60.56	.12
American Indian	Seboyeta 2nd	American	10	382.30	411.00	408.83	54.35	
Anglo American	San Mateo 2nd	Mexican	8	389.13	372.50	373.53	116.81	1.51
Mexican American	Seboyeta 2nd	American	10	398.80	430.50	429.68	60.89	
Anglo American	San Mateo 2nd	Mexican	8	476.50	481.25	466.51	47.81	.12
Anglo American	Seboyeta 2nd	American	10	419.60	463.00	474.79	51.00	
Anglo American	San Mateo 2nd	Mexican	8	379.25	360.00	363.02	89.90	.43
American Indian	Seboyeta 2nd	American	10	389.80	391.00	388.59	83.21	
American Indian	San Mateo 2nd	Mexican	8	409.25	436.88	437.16	48.73	.00
Mexican American	Seboyeta 2nd	American	10	411.60	437.50	437.27	71.00	
American Indian	San Mateo 2nd	Mexican	8	371.00	413.13	413.20	80.27	.02
Anglo American	Seboyeta 2nd	American	10	375.40	407.50	407.44	78.59	
American Indian	San Mateo 2nd	Mexican	8	421.50	448.75	449.67	56.22	.06
American Indian	Seboyeta 2nd	American	10	411.50	444.00	443.26	51.27	

TABLE XVIII - (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	San Mateo 2nd	Mexican	8	424.25	449.38	434.22	56.20	.15
Mexican American	Sierra Vista 2nd	American	8	345.13	401.25	416.40	91.30	
Mexican American	San Mateo 2nd	Mexican	8	434.25	414.38	394.94	88.79	.09
Anglo American	Sierra Vista 2nd	American	8	359.63	359.38	378.81	109.96	
Mexican American	San Mateo 2nd	Mexican	8	413.25	416.25	419.50	60.56	1.32
American Indian	Sierra Vista 2nd	American	8	307.75	363.75	360.50	99.24	
Anglo American	San Mateo 2nd	Mexican	8	389.13	372.50	356.40	116.81	.005
Mexican American	Sierra Vista 2nd	American	8	298.50	344.38	360.47	86.80	
Anglo American	San Mateo 2nd	Mexican	8	476.75	481.25	470.74	47.81	1.75
Anglo American	Sierra Vista 2nd	American	8	402.88	401.88	412.39	87.93	
Anglo American	San Mateo 2nd	Mexican	8	379.25	360.00	318.39	89.90	.33
American Indian	Sierra Vista 2nd	American	8	289.63	309.38	350.99	140.57	
American Indian	San Mateo 2nd	Mexican	8	409.25	436.88	440.00	48.73	1.59
Mexican American	Sierra Vista 2nd	American	8	346.00	381.88	378.75	99.94	
American Indian	San Mateo 2nd	Mexican	8	371.00	413.13	402.85	80.27	1.49
Anglo American	Sierra Vista 2nd	American	8	295.63	320.00	330.28	127.84	
American Indian	San Mateo 2nd	Mexican	8	421.50	448.75	445.19	56.22	.75
American Indian	Sierra Vista 2nd	American	8	400.00	405.00	408.56	98.87	

TABLE XVIII – (Continued)

Variable	School & Grade Level	Ethnic Group	N	Pre-Test Mean	Post-Test Mean	Adj Post-Test Mean	St'd Dev	F Ratio
Mexican American	Seboyeta 2nd	Mexican	10	401.40	430.50	413.36	76.73	.07
Mexican American	Sierra Vista 2nd	American	8	345.13	401.25	422.67	91.30	
Mexican American	Seboyeta 2nd	Mexican	10	445.70	430.50	410.01	72.99	.30
Anglo American	Sierra Vista 2nd	American	8	359.63	359.38	384.98	109.96	
Mexican American	Seboyeta 2nd	Mexican	10	382.30	411.00	406.28	54.35	.68
American Indian	Sierra Vista 2nd	American	8	307.75	363.75	369.64	99.24	
Anglo American	Seboyeta 2nd	Mexican	10	398.80	430.50	415.85	60.89	1.80
Mexican American	Sierra Vista 2nd	American	8	298.50	344.38	362.68	86.80	
Anglo American	Seboyeta 2nd	Mexican	10	419.60	463.00	459.53	51.00	2.79
Anglo American	Sierra Vista 2nd	American	8	402.88	401.88	406.21	87.93	
Anglo American	Seboyeta 2nd	Mexican	10	389.80	391.00	359.44	83.21	.03
American Indian	Sierra Vista 2nd	American	8	289.63	309.38	348.82	140.57	
American Indian	Seboyeta 2nd	Mexican	10	411.60	437.50	439.16	71.00	1.50
Mexican American	Sierra Vista 2nd	American	8	346.00	381.88	379.80	99.94	
American Indian	Seboyeta 2nd	Mexican	10	375.40	407.50	404.71	78.59	1.87
Anglo American	Sierra Vista 2nd	American	8	295.63	320.00	323.49	127.84	
American Indian	Seboyeta 2nd	Mexican	10	411.50	444.00	441.95	51.27	.90
American Indian	Sierra Vista 2nd	American	8	400.00	405.00	407.56	98.87	

School Personnel Attitudes and Perceptions Relative to the Bilingual/ Bicultural Program

A questionnaire to ascertain school personnel perceptions and attitudes about the Grants Bilingual/Bicultural program was given to program teachers and aides, non-program teachers, and administrators. Ten major attitudinal/perceptual variables, representing the means of several related sub-variables, are illustrated in Tables XIX to XXIV. Each variable is rated in reference to the categories favorable, minimal or average, and unfavorable. The favorable dimension is represented with a score of three, the minimal or average dimension with a score of two and the unfavorable response with a score of one.

Tables XIX to XXIII show the mean responses by school personnel in four schools relative to the ten principal variables. Using a 2.5-3.0 range as an indication of favorableness, the data in the tables show a consistent pattern of positive responses among personnel in all schools with reference to teacher attitudes toward the inclusion of a bilingual program at various grade levels. A favorable response pattern also is found relative to student involvement and interaction in the learning process.

School personnel, in general, perceive the "transfer" and "interfering" effects of early Spanish or Indian language usage in the curriculum as minimal. Further, they envision children's attitudes toward the Spanish or Indian speaking cultures as average.

Availability and relevancy of Spanish and Indian language basic and supplementary materials are considered average by school personnel. While the Laidlaw Brothers series is being used advantageously in furthering the Spanish communication skills, the teachers are continuing

the search for learning materials relative to the Spanish-speaking people in the Southwest. Since the Keresan dialect presently is not a written language, the utilization of reading materials in this language is not found in the bilingual program. However, native plays, songs, and oral language are found in the learning activities. Thus, the minimal response pattern on these variables also must be interpreted in terms of other cultural references.

School personnel tend to view the effects of in-service training in enlisting support for the bilingual program as <u>average</u>. The extent of involvement by school personnel in developing the bilingual program also is perceived as <u>average</u>.

Based on the foregoing observations, school personnel attitudes and perceptions relative to the ten variables in the questionnaire tend to be average or favorable, with the majority of the responses placing in the <u>average</u> column. It is noted that, while the mean ratings relative to the majority of the variables are not in the favorable (2.5 to 3.0) category, none of the mean ratings appear in the <u>unfavorable</u> column. It is, therefore, concluded that school personnel appear to be supportive of the program, but they also advocate that continuous effort be extended to realize more optimal effects in the program.

Bilingual/bicultural education must be viewed as a phenomenon that permeats the entire school, rather than regarding it as a special program apart from the main educational focus. In essence, it must be interpreted as an integral and continuous curricular/instructional component. Thus, the bilingual program must be envisioned and fully accepted by

all school personnel, not as a temporary Title VII experimental program, but as a continuous and valid characteristic of the total school program.

Development and inclusion of bilingual and bicultural features can be considered by teachers in other curricular activities. For example, in the training of students for band activities, in addition to the traditional Anglo American musical compositions, the band director can incorporate Hispanic and Indian musical themes.

Hispanic and Indian cultural elements can play a significant role in the songs, drama, role playing, poems, stories, history, geography, and other learning activities used by teachers throughout the school systems. Bilingual/bicultural education need not be limited to classrooms supported by Title VII funds.

The development of a multicultural school setting, where various languages and cultures are recognized and given a place in the curriculum, must be viewed as a valid and significant educational objective. The notion of total inclusion and involvement by teachers, students, administrators, and community people in realizing this objective can be given increased attention in the district. Thus, in-service training institutes for all school personnel are needed to promote increased commitment for the development and application of bilingualism and multicultural references in the total school system.

TABLE XIX - SAN RAFAEL SCHOOL PERSONNEL PERCEPTIONS RELATIVE TO THE BILINGUAL PROGRAM

Variables	Bilingual Teachers Means	Bilingual Teacher Aides Means	Non-Program Test Means	Admin of Director Means	Composite the Means
1. Transfer effects of early Spanish or Indian language instructional usage to English language development.	2.2	2.0	2.2	2.8	2.3
2. Interference effects of early Spanish or Indian language instructional usage to English language development.	1.5	2.0	1.5	1.0	1.5
3. Attitudes of children toward the Spanish or Indian speaking cultures.	1.8	1.8	2.0		1.9
4. Student involvement and interaction in the learning process and activities.	2.0	2.8	2.7		2.5
5. Teacher attitudes toward inclusion of a bilingual program at various grade levels.	2.7	3.0	2.8	2.8	2.8
6. Availability of basic Spanish or Indian language instructional materials (e.g., texts).	1.5	1.4	1.3	3.0	1.8
7. Availability of Spanish language supplementary materials and A-visual aides.	2.0	2.0	1.2	3.0	2.1
8. Relevancy of present Spanish or Indian language arts content to the culture of the target groups.	2.0	1.2	1.2	3.0	1.9
9. Effects of inservice training in enlisting support for the bilingual program.	1.7	1.8	1.3	3.0	2.0
10. Extent of involvement by school personnel in developing the bilingual program.	1.8	1.9	1.8	3.0	2.1

TABLE XX - SEBOYETA SCHOOL PERSONNEL PERCEPTIONS RELATIVE TO THE BILINGUAL PROGRAM

Variables	Bilingual Teachers Means	Bilingual Teacher Aides Means	Non-Program Test Means	Admin of Director Means	Composite the Means
1. Transfer effects of early Spanish or Indian language instructional usage to English language development.	1.2	1.0	1.8	2.0	1.5
2. Interference effects of early Spanish or Indian language instructional usage to English language development	1.0	1.0	1.6	2.0	1.4
3. Attitudes of children toward the Spanish or Indian speaking cultures.	2.3	1.3	1.7	2.6	2.0
4. Student involvement and interaction in the learning process and activities.	3.0	2.0	2.4	2.4	2.5
5. Teacher attitudes toward inclusion of a bilingual program at various grade levels.	3.0	3.0	3.0	3.0	3.0
6. Availability of basic Spanish or Indian language instructional materials (e.g., texts).	2.0	2.0		2.0	2.0
7. Availability of Spanish language supplementary materials and A-visual aides.	1.0	1.0	2.0	2.0	1.5
8. Relevancy of present Spanish or Indian language arts content to the culture of the target groups.	2.0	2.0	3.0	2.0	2.5
9. Effects of inservice training in enlisting support for the bilingual program.	2.0	1.8	1.8	2.5	2.1
10. Extent of involvement by school personnel in developing the bilingual program.	2.2	2.0	2.0	3.0	2.3

TABLE XXI - SIERRA VISTA SCHOOL PERSONNEL PERCEPTIONS RELATIVE TO THE BILINGUAL PROGRAM

Variables	Bilingual Teachers Means	Bilingual Teacher Aides Means	Non-Program Test Means	Admin of Director Means	Composite The Means
1. Transfer effects of early Spanish or Indian language instructional usage to English language development.	2.2	2.5	1.8	2.0	2.1
2. Interference effects of early Spanish or Indian language instructional usage to English language development	1.8	1.8	2.1	2.0	1.9
3. Attitudes of children toward the Spanish or Indian speaking cultures.	1.8	1.8	1.7	1.7	1.8
4. Student involvement and interaction in the learning process and activities.	2.5	2.3	2.6	3.0	2.6
5. Teacher attitudes toward inclusion of a bilingual program at various grade levels.	3.0	2.6	2.8	3.0	2.9
6. Availability of basic Spanish or Indian language instructional materials (e.g., texts).	1.9	2.0	1.0	2.0	1.7
7. Availability of Spanish language supplementary materials and A-visual aides.	1.5	1.7	1.9	2.0	1.8
8. Relevancy of present Spanish or Indian language arts content to the culture of the target groups.	2.1	2.2	1.5	2.0	2.0
9. Effects of inservice training in enlisting support for the bilingual program.	2.2	2.1	2.4	2.5	2.3
10. Extent of involvement by school personnel in developing the bilingual program.	2.0	1.7	2.4	1.8	2.0

TABLE XXII - CUBERO SCHOOL PERSONNEL PERCEPTIONS RELATIVE TO THE SPANISH/ENGLISH BILINGUAL PROGRAM

Variables	Bilingual Teachers Means	Bilingual Teacher Aides Means	Non-Program Test Means	Admin of Director Means	Composite the Means
1. Transfer effects of early Spanish or Indian language instructional usage to English language development.	2.2	2.0			2.1
2. Interference effects of early Spanish or Indian language instructional usage to English language development	2.0	2.0			2.0
3. Attitudes of children toward the Spanish or Indian speaking cultures.	2.0	1.7			1.8
4. Student involvement and interaction in the learning process and activities.	2.3				2.3
5. Teacher attitudes toward inclusion of a bilingual program at various grade levels.	3.0				3.0
6. Availability of basic Spanish or Indian language instructional materials (e.g., texts).	2.1				2.1
7. Availability of Spanish language supplementary materials and A-visual aides.	2.2				2.2
8. Relevancy of present Spanish or Indian language arts content to the culture of the target groups.	2.8				2.8
9. Effects of inservice training in enlisting support for the bilingual program	2.6	2.8			2.7
10. Extent of involvement by school personnel in developing the bilingual program	2.4	2.5			2.5

TABLE XXIII - CUBERO SCHOOL PERSONNEL PERCEPTIONS RELATIVE TO THE KERESAN/ENGLISH BILINGUAL PROGRAM

Variable	Bilingual Teachers Means	Bilingual Teacher Aides Means	Non-Program Test Means	Admin of Director Means	Composite The Means
1. Transfer effects of early Spanish or Indian language instructional usage to English language development.	1.5	1.5			1.5
2. Interference effects of early Spanish or Indian language instructional usage to English language development.	1.4	1.4			1.4
3. Attitudes of children toward the Spanish or Indian speaking cultures.	2.3	2.3			2.3
4. Student involvement and interaction in the learning process and activities.	3.0	3.0			3.0
5. Teacher attitudes toward inclusion of a bilingual program at various grade levels.	3.0	3.0			3.0
6. Availability of basic Spanish or Indian language instructional materials (e.g., texts).					
7. Availability of Spanish language supplementary materials and A-visual aides.					
8. Relevancy of present Spanish or Indian language arts content to the culture of the target groups.	1.0	1.0			1.0
9. Effects of inservice training in enlisting support for the bilingual program.	3.0	3.0			3.0
10. Extent of involvement by school personnel in developing the bilingual program.	2.8	2.8			2.8

TABLE XXIX - SCHOOL DISTRICT PERSONNEL PERCEPTIONS RELATIVE TO THE BILINGUAL PROGRAM

Variable	Bilingual Teachers Means	Bilingual Teacher Aides Means	Non-Program Test Means	Admin of Director Means	Composite the Means
1. Transfer effects of early Spanish or Indian language instructional usage to English language development.	1.9	1.9	1.9	2.3	2.0
2. Interference effects of early Spanish or Indian language instructional usage to English language development.	1.6	1.9	1.7	1.7	1.7
3. Attitudes of children toward the Spanish or Indian speaking cultures.	2.0	1.7	1.7	1.7	1.8
4. Student involvement and interaction in the learning process and activities.	2.5	2.4	2.6	2.7	2.6
5. Teacher attitudes toward inclusion of a bilingual program at various grade levels.	2.9	2.9	2.9	2.9	2.9
6. Availability of basic Spanish or Indian language instructional materials (e.g., texts).	1.9	1.8	1.2	2.3	1.8
7. Availability of Spanish language supplementary materials and A-visual aides.	1.7	1.6	1.7	2.3	1.8
8. Relevancy of present Spanish or Indian language arts content to the culture of the target groups.	2.2	1.8	1.9	2.3	2.1
9. Effects of inservice training in enlisting support for the bilingual program.	2.1	2.1	1.8	2.7	2.2
10. Extent of involvement by school personnel in developing the bilingual program.	2.1	2.0	2.1	2.6	2.2

V. CONCLUSIONS AND RECOMMENDATIONS

The SWCEL Test of Oral English Production was used to determine the oral English language proficiency of experimental group children in the Grants Bilingual Program. While few significant gains in oral language development are noted, it is found that the majority of the children were scoring (pre- and post-test results) near the region of maximum score relative to the language variables measured by the test. More frequent significant gains are found in language structure. This is attributable to the greater number of items in this language component as compared to the two other variables--pronunciation and vocabulary. It therefore can be concluded that, generally speaking, Grants first grade children are operating in oral English near or beyond the language content measured by the SWCEL Test. Thus, these children are ready for instruction in all of the English communication skills. These children, in general, are beyond an English as a Second Language program based only in oral language development. However, this does not preclude the possibility of using an oral language approach for individual children who essentially are non-English speakers.

Experimental group achievement in language development, science concepts and social science concepts, with Spanish as an instructional medium, was noted through analysis of variance based on the Test of Basic Experiences.

The language medium (Spanish) in the TOBE Test appears to be a significant element in measuring achievement relative to the three TOBE variables--language development, science concepts and social science concepts. Significant gains are found among Mexican American

children in the program, especially in the second grade. Both pre-test and post-test means are found to be higher for Mexican American children as compared to Anglo American and American Indian children. Pre-test and post-test mean scores among Anglo American and American Indian children relative to the three TOBE variables are closely related. Thus, since the TOBE was administered in Spanish, Anglo American and American Indian children may not be expected to measure as high on the TOBE Test as compared to children with a Spanish speaking background. (This may be noteworthy for researchers, educators, teachers and counselors as an analogy when comparing achievement test results, with test instruments based on English and other Anglo American cultural features, between Mexican American children and Anglo American children.) In terms of the foregoing analyses, based on the TOBE Test results, it is concluded that the Grants Bilingual Program is attaining one of its principal objectives--enhancing the ability of children to function academically in more than one language. Additionally, it also is achieving the objective of teaching the non-English speaking child to use two languages, while concurrently advancing the Mexican American child's Spanish speaking proficiency.

Experimental group achievement in reading, arithmetic, mechanics of English and spelling, with English as a communication medium, was observed through analysis of variance based on the California Achievement Test. Achievement gains indicated by the CAT are by far the most noteworthy results found in the study. Significant and dramatic gains are consistently found among the three cultural groups in the majority of the project schools.

Achievement gains, with the majority at the .01 level of confidence, are found among second grade Mexican American experimental children in Cubero, San Mateo, San Rafael, Seboyeta, and Sierra Vista. Mexican American children in the bilingual program placed at or beyond the second grade level in the April, 1971, CAT post-test results.

Significant achievement gains also are found among second grade Anglo American experimental children in the San Rafael and Sierra Vista schools. Additionally, it is noted that Anglo American experimental children in the schools placed at/or beyond the second grade level in the April 1971, CAT post-test results.

The greatest gains found among second grade American Indian children in Cubero were in reading comprehension and mechanics of English. Instructional emphasis may be extended in arithmetic fundamentals and spelling, with percentage gains noted at 5.22 and 8.33 respectively. In Seboyeta, the greatest gains among second grade American Indian children are in reading comprehension and spelling. Instructional emphasis may be applied in reading vocabulary and arithmetic fundamentals. Otherwise, American Indian children in the two schools placed near or at the second grade level relative to the April, 1971, CAT post-test results.

Statistical data, based on the CAT, show that the pre-test mean of second grade Mexican American children was eighteen to nineteen points below that of Anglo American and American Indian second grade children. In the post-test comparison, the mean difference is noted at sixteen points below that of Anglo American children and seven points above that of American Indian children. It is, therefore, recommended

that a similar statistical comparison be undertaken in the 1971-72 evaluation study to ascertain rate of achievement between the three cultural groups, comparative increase or decrease in achievement gains between the three cultural groups (achievement gaps, based on pre/post-test results and on a longitudinal analysis), and achievement gains based on experimental versus control group comparative analyses.

The statistical findings illustrate particular CAT variables requiring attention among the three cultural groups in the study. For example, while significant gains are noted in mechanics of English among second grade Mexican American children in the San Rafael School, the post-test mean shows this group of children below grade level (1.4). Special instructional emphasis may be extended in this particular area. And while dramatic gains are found among second grade Mexican American children in the Sierra Vista school, continuous attention may be given in the areas of reading comprehension and arithmetic processes.

Based on the existing data, it is not possible to ascertain differences in achievement gains between program and non-program children in terms of the CAT variables; however, it can be concluded that the dual language medium in the bilingual program has not been detrimental to academic achievement among children in the program. Further study is required to determine if the bilingual program tends to accelerate the learning of program children as compared to non-program children. Thus, a control group versus experimental group comparison should be incorporated in the 1971-72 evaluation plan.

The Caldwell Test was used to provide additional data in cognitive development among first grade children, with Spanish used as a language

medium. The statistical findings show that, in general, the experimental group children scored at least at the fifty percent level in the pre-test. It is noteworthy that the children were responding correctly at the fifty percent level to the pre-test items given in Spanish. This clearly reveals that Mexican American children in the Grants geographical area, on the average, enter school with some Spanish speaking background. With this type of structural and phonetic language reference found among these children, it is concluded that a Spanish/English bilingual program is a highly relevant curriculum component in the Grants School District.

A Cultural Sensitivity Test was administered to determine experimental children's perceptions about relationships between children from three American cultural groups--Anglo American, American Indian, and Mexican American. Two noteworthy findings are indicated in the statistical analyses based on the cultural sensitivity measure. Experimental group children's perceptions about the relationship of children in the three cultural groups tend to change in the positive direction over an eight month period. Further study is suggested to determine the degree of attitudinal change over a longer period of time. A second finding shows that, in general, the experimental children's perceptions about relationships between the three cultural groups place in the favorable side of the sensitivity scale. It is noted that none of the experimental group means are found below the mid-point reference area. It is recommended that the test be used again at the third grade level in the 1971-72 evaluation plan with reference to the test results of prior years. This will provide data on attitudinal changes among

experimental children over a longer period of time. Additionally, a control versus experimental group comparison can reveal the effects of the bilingual/bicultural program relative to the attitudinal variables measured by the test.

A questionnaire to ascertain school personnel perceptions and attitudes about the Grants Bilingual/Bicultural program was given to program teachers and aides, non-program teachers, and administrators. Generally, findings show a consistent pattern of positive responses among personnel in all of the schools toward the inclusion of a bilingual program at various grade levels. A favorable response pattern also is found relative to student involvement and interaction in the learning process. School personnel, in general, also perceive the "transfer and interfering" effects of early Spanish or Indian language usage in the curriculum as minimal. Further, they envision children's attitudes toward the Spanish and Indian speaking cultures as average. The availability of Spanish language materials is classified as average, but teachers are continuing their search for additional basic and supplementary references. Additionally, the effects of the inservice training are viewed as average.

Based on the questionnaire data, school personnel attitudes and perceptions relative to the ten questions about the bilingual program tend to be average or favorable, with the majority of the responses placing in the average column. It is, therefore, concluded that school personnel, in general, appear to be supportive of the program, but it also is advocated that continuous effort be extended to realize greater involvement and commitment by all school personnel in the developmental process. It is in this sense that bilingual/bicultural education may have a chance to become an integral component of the total curriculum.